

CTO

The Magazine for Information Executives

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*Source: IDC, December 1999. *Who Will be Leading the Global IT Services Industry in 2000?*: A Competitive Analysis by Mauro Peres, Sophie Janne Mayo.

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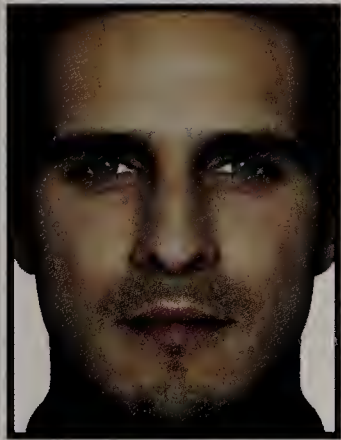
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Cover photo by Ethan Hill

GOOD MORNING



Once again, today has arrived. And it brings with it the same meetings, the same problems, and, in many cases, the same solutions. Unfortunately, many of those same solutions aren't working. Because business has been transformed by the little letter e. And the technology that was once the domain of twentysomethings with a website and a warehouse in their garage is now an integral part of every business. Fortunately, however, the same principles that made for good management before still make good eBusiness sense. Of course, that's a lot more difficult now that your business isn't contained by four walls and needs to be accessible anywhere, anytime, for anyone. That's why it's more important than ever to have the very best software. Software that manages your business processes – integrating all parts of your company, including suppliers and partners, to make sure that they're working together seamlessly. Software that manages information – storing, accessing, and utilizing the vast wealth of knowledge that you continually gather about yourself and your customers. Software that manages your infrastructure – maintaining and securing your assets while letting you see the big picture to ensure that everything keeps running smoothly. There's no doubt about it. Things have changed. But that just means there will be new solutions to the old problems. And we think that's a change for the better.

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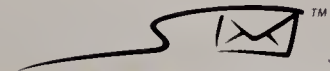
When it comes to wireless email, there's one thing most products ignore. It's that 'little' issue called security. Then there's BlackBerry.™ It's a complete wireless email solution actually engineered to meet your corporate security standards. BlackBerry is a totally integrated package that features powerful wireless handhelds, desktop tools, enterprise server software, advanced encryption technology and nationwide airtime. With support for Triple DES encryption, BlackBerry's end-to-end security model ensures the authentication, integrity and confidentiality of all incoming and outgoing email messages. No wonder BlackBerry is becoming the corporate standard for wireless email. It's safe to say that it's the best for business.

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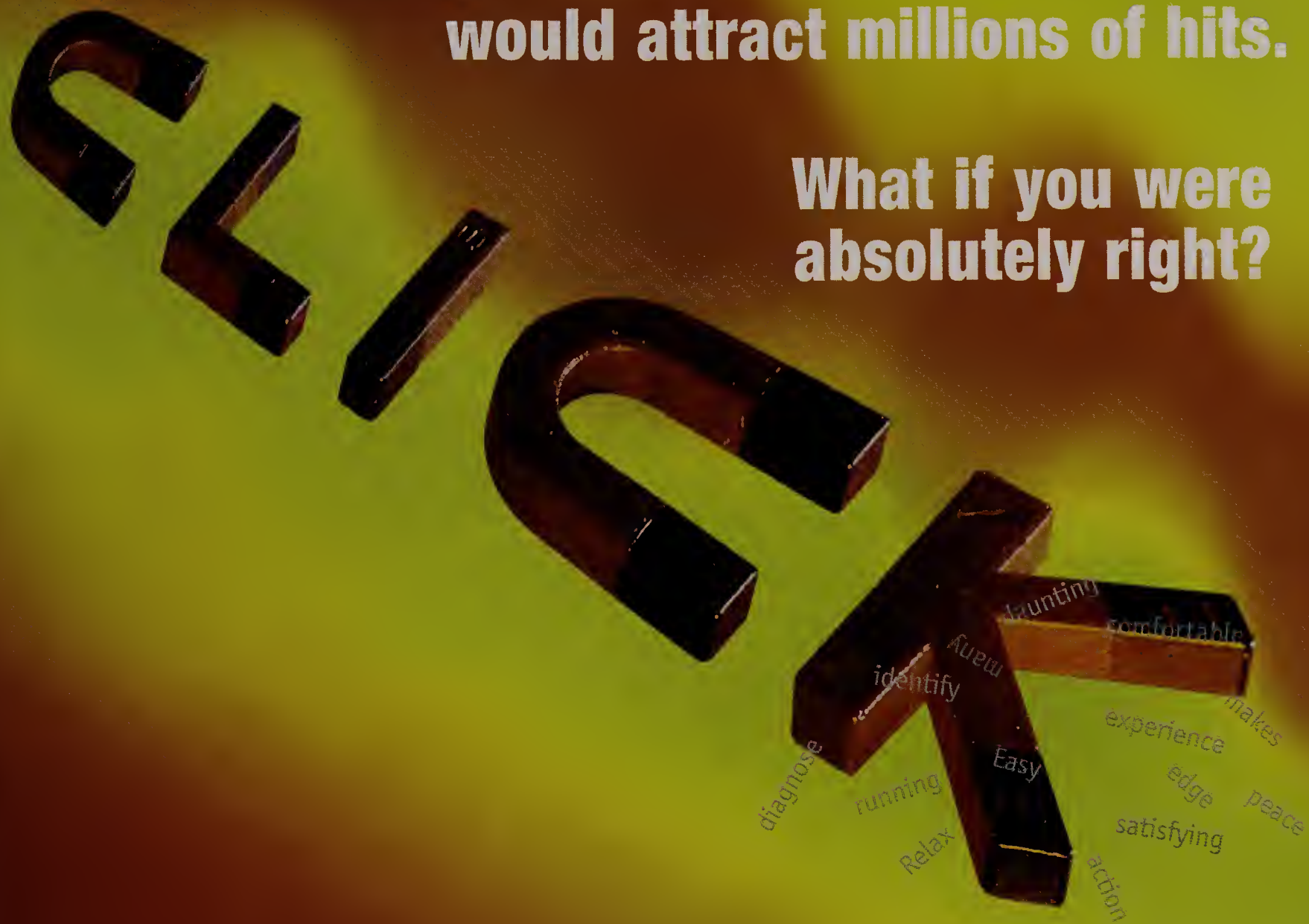
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Opinion Online

Tom Field at Large

THE FIELD REPORT When the Cheyenne River Sioux attempt to attract hot new IT jobs, when San Diego county embarks on a major outsourcing project, *CIO* Executive Editor Tom Field is there.

www.cio.com/CIO/fieldreport

Katarina Bonde on Website Globalization

ASK THE EXPERT Have a question about globalizing your website? From now until March 15, Katarina Bonde, CEO and president of Bellevue, Wash.-based Glides, is online to offer advice on the tricky cultural and technical issues companies face when they take their websites global.

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www.cio.com/forums/scm/edit/ecom.html

“Solutions must be implemented rapidly, pressures mount from expectant users, and the solutions vendors fly about your head like gnats.”

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THE FABLED FIVE NINES. ELUSIVE, COVETED

For a server operating system, the five nines are a measure of reliability that translates into just over five minutes of server downtime per year.* Of course, rumors of this 99.999% uptime usually start under ideal lab conditions. But where are these five nines when your company needs them? If you're using Microsoft® Windows® 2000 Server-based solutions, they may be closer than you think. Today Starbucks, FreeMarkets and MortgageRamp, an affiliate of GMAC Commercial Mortgage, are using Windows 2000 Server-based systems that are designed to deliver 99.999% server uptime. With system architecture improvements for higher server uptime plus fault-tolerant and redundant systems for increased availability, the Windows 2000 Server platform is helping these companies maximize uptime and

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DAND CLOSER THAN YOU THINK.

minimize network interruptions. But a server OS alone doesn't get you five nines, which is why we've teamed up with industry-leading system providers to ensure that the right combination of people, process and technology is utilized. Industry leaders such as Compaq, Hewlett-Packard, Unisys, Stratus and Motorola Computer Group can work with you to deliver solutions with up to five nines uptime with their custom-built Windows 2000 Servers shipping today. Of course, not all installations require this level of reliability, but one thing is for sure: The Windows 2000 Server family can help you get to the level of reliability you need, even five nines. To learn more about server solutions you can count on, visit microsoft.com/windows2000/servers **Software for the Agile Business.**

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From the Editor

lundberg@cio.com

What Are You Afraid Of?

When a convenience store is robbed, the clerk calls the cops, gives a description of the crooks, and the cops go on the hunt. If the information and the police work are good enough, the cops will catch the perpetrators before another convenience store gets hit. That's the way law enforcement works.

So why doesn't this kind of information sharing happen when it comes to computer crime?

Fear. Executives are afraid they'll:

Become a target. If they say they've been hacked or have concerns of being hacked, they show their vulnerability. Like wounded cubs on the Serengeti Plain, the hyenas will move in to finish them off.

Become a challenge. If, on the other hand, they say their systems are secure, it's like throwing down the gauntlet to hackers. "Either way, it [sets] us up as a target and a challenge for hackers," says an anonymous CIO in "Conspiracy of Silence," beginning on Page 92.

Damage confidence (and revenue and valuation). If news leaks out to customers, it could hurt their confidence in the company. Investors might downgrade the company's stock. Even sharing the information within the inner circle could trigger a negative reaction among shareholders.

These are serious concerns. But letting them drive behavior may be giving the bad guys the upper hand.

"Hackers share information," said computer crime fighter Gail Thackeray at a CIO Perspectives Conference in October 2000. "We don't. We need to share information between industry and law enforcement."



Bruce Schneier, author of *Secrets & Lies: Digital Security in a Networked World*, agrees. "We need to publicly understand why systems fail. Secrecy only aids the attackers."

Until corporations start sharing information with each other and with law enforcement about what's actually going on, the bad guys will keep the upper hand. And I've got news for you: The real bad guys haven't even arrived on the scene yet.

The recent move by Microsoft, Oracle, Cisco and others to form a security coalition is a promising step in the right direction, following the lead of three other industries (banking, telecom and electric) to share information within their community. But these coalitions are under no obligation to share information with law enforcement (and vice versa), and there are no early signs that they'll be inclined to do so.

The FBI has plans of its own, rolling out its Infragard intrusion alert program on a national level (for more on this, see Martha Heller's Sound Off column at comment.cio.com/sound.cfm?ID=85).

Industry-only information sharing is fine if all you want to do is shore up your defenses. But once the real criminals and terrorists start working the Internet in an organized way (and it won't be long), don't you think you'll want to have the crime fighters in the loop? Let me know at lundberg@cio.com.

Allie Lundberg



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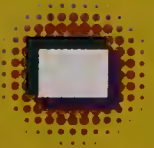
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Reader Feedback

WOMEN IN TECHNOLOGY, REVISITED

About "The Forgotten Majority" [Difference Engine, Nov. 1, 2000]: I am a woman who loves technology. I was lucky enough to have a mom who worked as an administrative assistant at a computer company. She got us a deal on an Eagle PC when I was about 11 years old. My dad, being an engineer, figured everything out. But then, seeing that I was attracted to some of the games that were on the computer, he showed me how to use it. I got a four-year degree in marketing, decided I didn't want to do sales, and went back to school for computer programming. I'm about halfway through with my associate's degree and have a straight-A average.

I think a major reason many women don't like technology is because they perceive it as geeky and as something that keeps them from being in contact with other people. In contrast, I constantly e-mail my friends and have met many people through chat rooms, Web rings and Listservs. Also, some women I've talked to say they don't want to be chained to a desk using a computer all day. I've been temping for two years now and have yet to find an administra-

tive position (one of the "traditional" female office jobs) where I'm not sitting at a desk all day and using a computer for something.

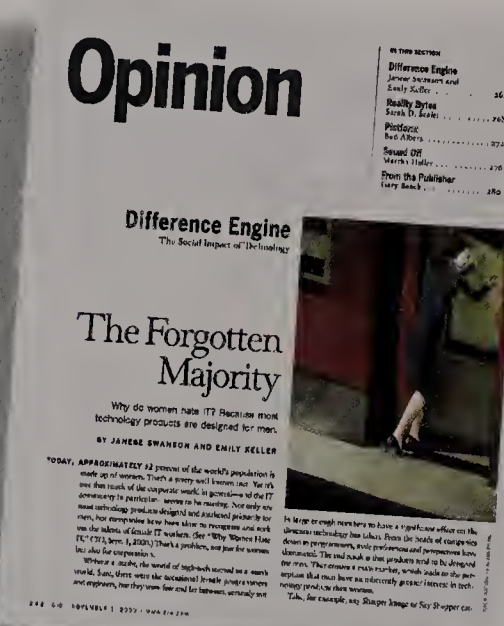
Technology is wonderful, but it has to be perceived as wonderful. That is one of the problems. Today's culture says that you have to be "cool." Until we can get teenage girls and young women to look at technology as being cool instead of nerdy, they aren't going to be enthusiastic about it.

Emily M. Hanson

Maple Grove, Minn.

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Up until I read "The Forgotten Majority," I believed the terms *women* and *technology* were a dichotomy of the worst extremes. I want so very much to learn about computers but have often felt intimidated by the terminology, the austere look of technological inventions and even the colors. I was excited when Apple came out with computers in different colors, and I thought their flowing shape was beautiful. At the time, I thought that Apple



had a winner and was finally trying to appeal to a broader base, kind of like Saturn had done with cars.

I find myself secretly wishing that I could work for a company that appealed to women—to me. Everywhere you look, it's a man's world and women are trying to fit in, as if somehow we don't belong unless we see things their way; and we can't succeed unless we dress like them and think like them. It's very discouraging, to say the least.

So my hat is completely off and flying in the air in respect for Janese Swanson of Girl Tech for having the courage, foresight and intelligence to go into an intimidating business first of all, and then for having the guts, personal intuition and belief in herself to pursue the impossible: bringing women into the 21st century and giving them elegant and feminine IT choices. God bless her!

Cindy Bresaw

Nationwide Insurance

Canton, Ohio

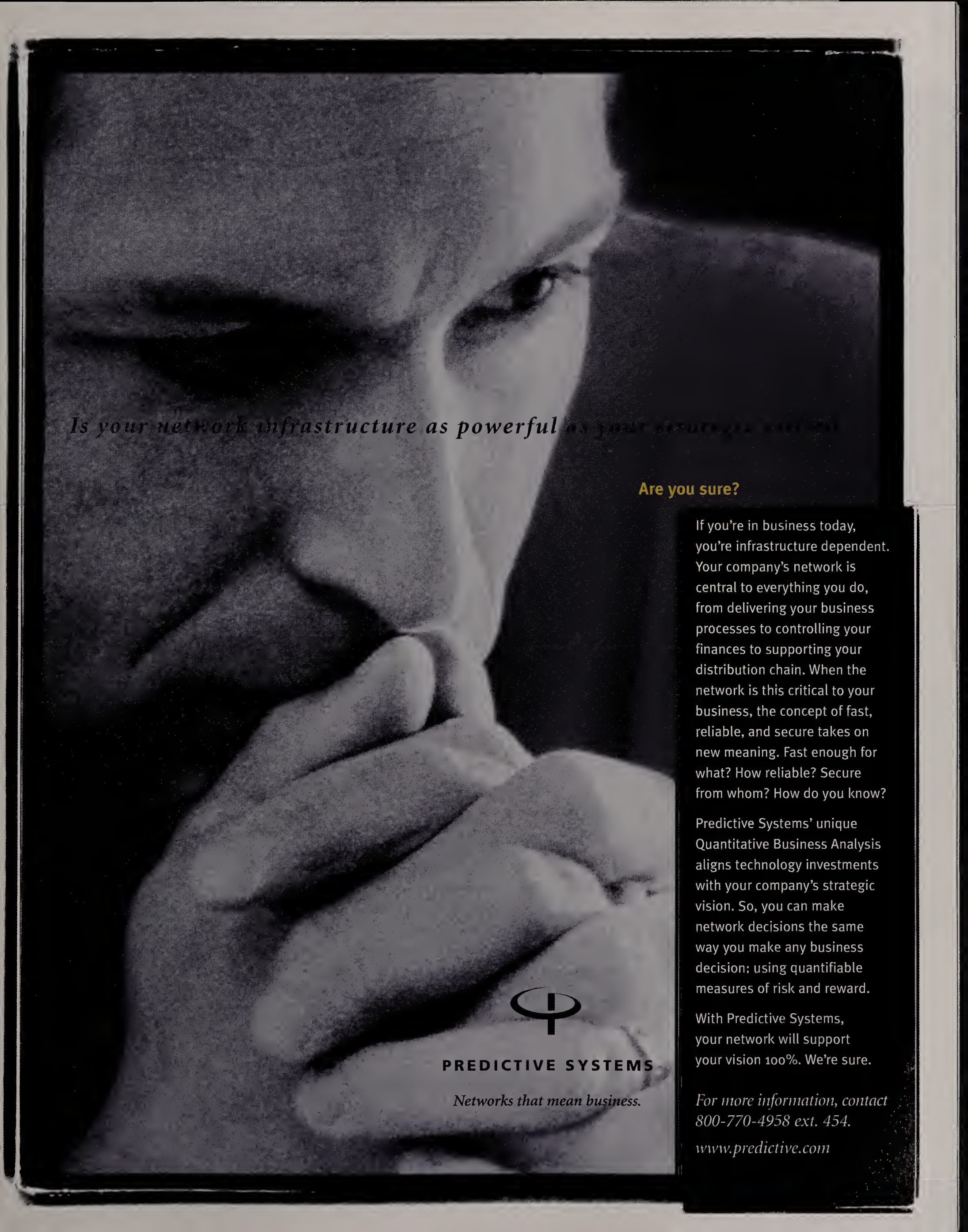
jason77@sssnet.com

THE FUTURE OF ONLINE SHOPPING IS NOT YET

The Nov. 1, 2000, Reality Bytes column ["Not Clicking"] made some good points about the flaws in online shopping. As a person who hates shopping of any kind but has to try on everything I hope to wear, I would like to do my (infrequent) clothes shopping online, but I don't see it happening. On the other hand, I am happy to buy things online like books and tools that don't come in sizes. I don't check things out in stores and then go looking for bargains online. (I also don't drive across town to save a dime on a gallon of gas, which drives my wife crazy.)

In the (not too) long run, my guess is that you will see lockable boxes popping up in front yards around the country. I don't see another answer (although given my lack of vision, that may not be the last word on the subject).

As a resident of a California town that has had some success at retaining and improving its downtown area, I have some concerns about the (inevitable) increase in online shopping,



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but the town has withstood the big boxes and drive-thrus reasonably well (although we do have a nasty old chain bookstore that drove out a couple of local bookstores). I don't think this evolution/revolution has even gotten started. My long-term prediction is that many players will fall out of both markets (online and in-person).

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insignificant compared to what it will take to adequately support them after they are installed.

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E-MAIL TIPS

I found "The Evils of E-Mail" [Difference Engine, Dec. 1, 2000] to be timely, on target and useful. While I agree that

league who is known for sending confusing and sometimes inflammatory e-mail messages. If I begin writing a response based on the emotions I feel when I first read a memo from this colleague, I usually end up deleting it because it ends up responding to the flames, not to the underlying business intent. Indeed, I have found that by writing a reactionary paragraph to get through the emotions, then thinking about the business needs, I can then focus on writing content that is helpful and valuable. The only downside is remembering to delete the first paragraph before sending! But as the author suggests, reviewing e-mail messages before sending should be a standard operation.

Another technique I use to stay focused on communicating well is to assume that my e-mail will be forwarded to other parties, including my boss. This is a great incentive to remain focused on the needs of the business and avoid emotional bantering that adds no value.

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Communications—e-mail or otherwise—can easily have unintended consequences.

SUPPORT IS THE REAL ISSUE

Because I have been studying this subject for some time and sensed a kindred spirit, I read Eric K. Clemons's Expert Advice column ["The Build/Buy Battle," Dec. 1, 2000] with great anticipation. I was too hasty. His subject is not, as the title suggests, "build versus buy," but rather "build versus have built." Clemons capably and comprehensively describes the pros and cons of outsourcing, but I found little new information.

The real challenge today is evaluating the advantages and disadvantages of buying prebuilt, off-the-shelf technology solutions as opposed to building them in-house. Should I ask my team of developers to build an electronic spreadsheet, or should I buy one? Seems like a silly question today, but it wasn't that long ago when this was a real question. The issues involved in the decision range from properly assessing technological acumen to managing HR (knowledge base/skill set) change. But the most important decision factor, overlooked in the column, is that of postproduction support. Whether systems are built internally or externally or simply bought off the shelf is really

there are indeed perils to be found in the use of e-mail, it may be as much the technology as its use that causes at least some of the problems. Sure, I agree that e-mail's anonymity, particularly between parties who don't know one another, has a high risk of being abused. On the other hand, in the case of the author's example when he typed, "You see, it's more complicated than that," and his friend found that pompous, I suggest that his friend would have found it equally as pompous had the author said it face-to-face or over the phone. As it is, the experience remains an example of how carefully communications—whether e-mail or otherwise—must be crafted and how easily they can have unintended consequences.

I appreciated some of the column's suggestions for helping to make e-mail better. I have found two techniques that help me use the medium in a more productive manner: First, I express my emotions, then delete them. Second, I assume my e-mail will be widely distributed. Unfortunately, I have found that not all e-mail correspondents take the time to consider their messages. I regularly communicate with one col-

CORRECTIONS

We incorrectly identified Dan McNicholl and his company in "On the Rise" in our Feb. 1, 2001, Enterprise Value Awards issue. McNicholl is GM North America's CIO of Information System and Service, which won an honorable mention in that issue.

In that same story, we transposed the name of another honorable mention, ESAB Welding & Cutting Products.

We apologize for the errors.

WHAT DO YOU THINK?

Send your thoughts and feedback to letters@cio.com. Letters may be edited for length or clarity.

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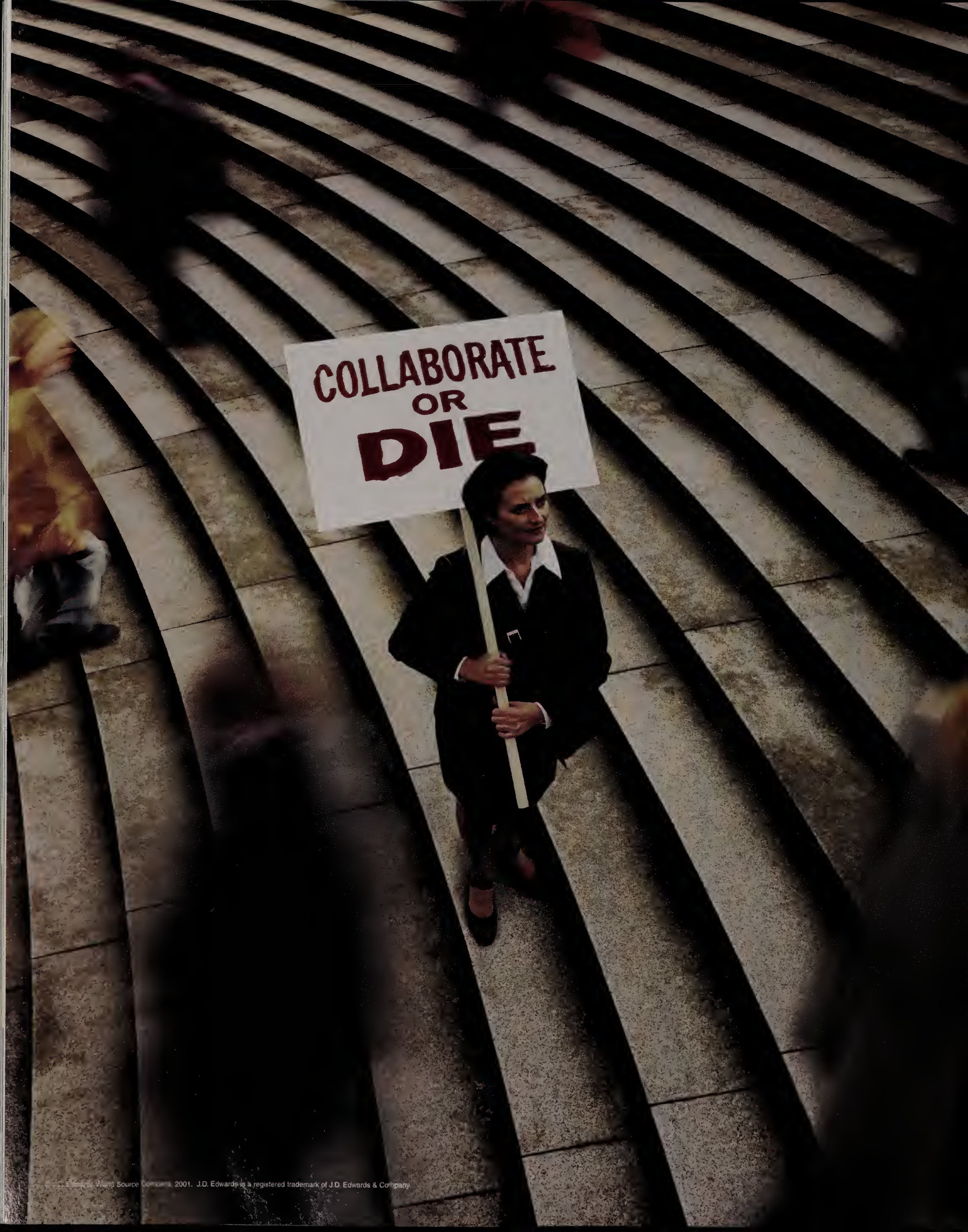
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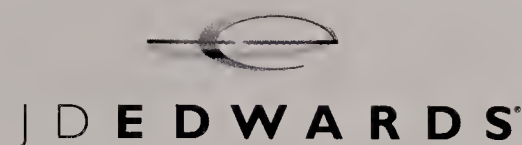
You're investing a small fortune integrating e-commerce into your core business processes and technologies. You need an e-CRM solution. You have mobile employees who work remotely. And on the horizon shines the future of converged networks, with easier integration, user access and management.

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mobile business

A high-angle, black and white photograph of a woman in a business suit standing on a wide set of stone stairs. She is holding a large white sign with the words "COLLABORATE OR DIE" in bold, dark letters. The stairs are made of large, rectangular stone blocks and recede into the distance, creating a strong sense of perspective. The woman is looking slightly to her right. The overall mood is serious and provocative.

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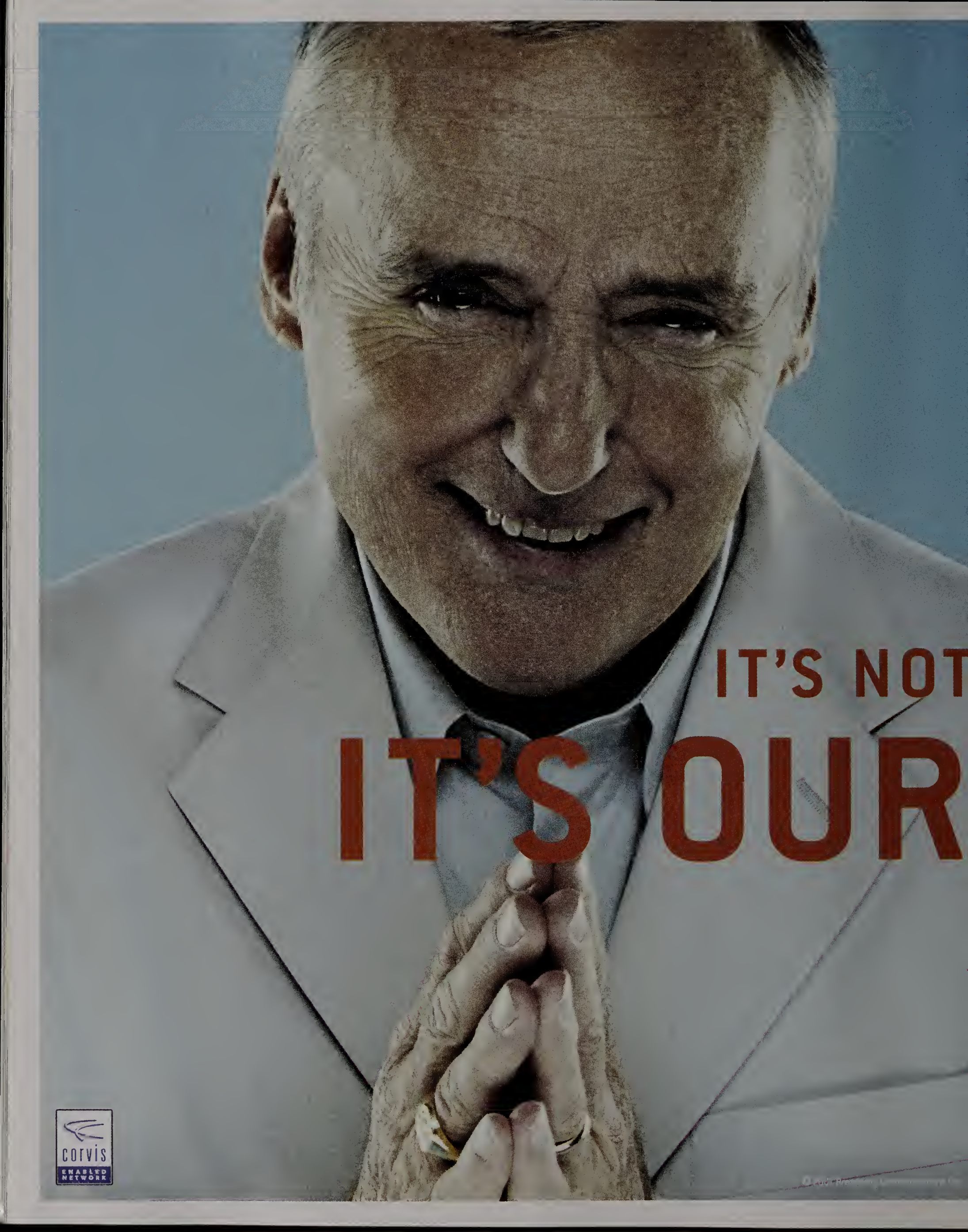
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Edited by Sandy Kendall

INNOVATION

The Big Chill *By Meg Mitchell Moore*



AS CONSUMERS, we all fancy ourselves inventors at one time or another. Who hasn't uttered this question: Wouldn't it be nice if they made a (insert the name of product) that did (insert brilliant idea)? But if the idea never meets the people who can put it into action, it simmers without ever coming to a boil.

One website is working to change that. Last fall Brightidea.com introduced the Icebox Innovation Contest. Sponsored jointly with Sears Kenmore, the contest challenged consumers to come up with ideas for improving refrigerators. "People who design refrigerators deal with a blank canvas," with no input from outsiders, says Matthew Greeley, CEO of Brightidea.com, a site that invites the sharing of all sorts of ideas. If creators hear from the people who use their products, they'll be more likely to keep their designs crisp.

Brightidea.com promoted the contest on its website, with banner ads and a marketing campaign. More than 3,500 individuals submitted over 4,000 ideas, ranging from the wacky (how about a fridge with a seat for cooling off in the summer?) to the eminently useful (let's find a way to keep those darn leftovers from getting lost in the back). Entrants could submit drawings but none were required. Judges included a senior

Continued on Page 34

SECURITY

Hack Off

THE NEW ECONOMY creates opportunity--and that goes for criminals too.

In Canada, 16-year-old "Mafiaboy" pleaded guilty in January to 56 charges of computer mischief. He is allegedly responsible for last year's denial-of-service attacks to Amazon.com, Dell Computer, eBay and Yahoo, and security breaches at CNN, Harvard and Yale. He faces up to two years in juvenile detention.

Dennis Moran, the 13-year-old known as "Coolio," pleaded guilty in January to three misdemeanor charges stemming from break-ins and defacements of the website of Internet security company RSA Security and antidrug site DARE.com. He'll serve nine months to a year in jail and pay \$5,000 restitution to each victim.

Feeling insecure? For more coverage of security matters, see Trendlines on Pages 40 and 44, and our special section starting on Page 80.

"YOUR CEO'S HANDHELD IS A POLLINATION DEVICE FOR MALICIOUS MOBILE CODE."

—Mudge, vice president of research & development, @Stake, speaking at the Internet Security Forum sponsored by CIO and Darwin magazines and the U.S. Critical Infrastructure Assurance Office

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The Big Chill

Continued from Page 32

product designer at Sears Kenmore, Greeley and one of the cosponsoring sites. The first-place winner, an entrant from Birmingham, U.K., received \$2,000 in cold cash. Second and third place received \$1,000 and \$500, respectively. The winning concepts become the property of Sears Kenmore—Brightidea.com can't reveal the specifics. Sears Kenmore will also collect information about the most frequently occurring suggestions to consider them for future designs.

Brightidea.com will keep working to bring together ideas with people who can make them happen. A handheld device contest debuted in January and in the works are deals with airlines and automakers. Customers may not always be right, but Brightidea.com is banking on the fact that they'll be creative.



T H E W E B

Free Tibet

EVER WONDER HOW to find Nirvana? Thanks to professional photographer and website producer Peter Danford, enlightenment is now just a click away at www.tibetgame.com and is, of course, free. But that doesn't mean it's going to be easy!

Begin your quest in Tibet's capital city, Lhasa, with 1,000 renminbi

(Chinese dollars), three illegal photos of the Dalai Lama and no karma. As you explore Tibet via 24 interlinked panoramas, the karmometer keeps track of your progress. Danford created the fluid 360-degree panoramas using LivePicture's PhotoVista, "stitching" together eight photographs of each scene taken at 45-degree increments with a 16 mm fish-eye lens. The final touches came from IBM Hotmedia, which turns the views into interactive playgrounds. Clickable "hot spots" offer a variety of stunning audio and visual experiences depicting Tibetan history and culture. Danford also presents political issues facing Tibet, making the site a pointed as well as lively educational tool. Rhetoric is kept at a minimum, however—the viewpoints never overshadow the views. —Amanda S. Fox

Maynard BY DARRIN BELL AND THERON HEIR





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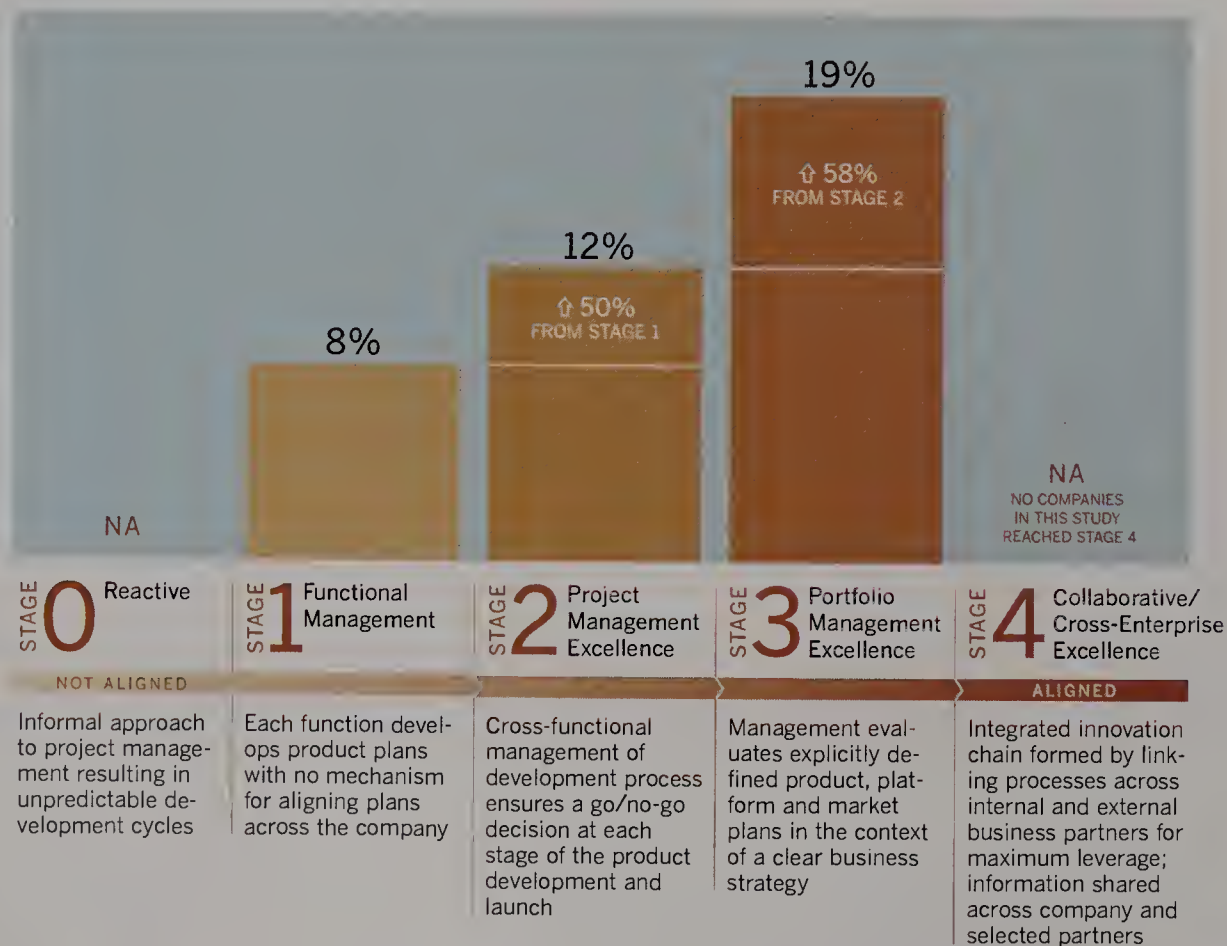
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Analyzing Product Development

PRODUCT DEVELOPMENT STRATEGY can have a measurable impact on revenue growth, according to a recent survey conducted by Waltham, Mass.-based management consultancy Pittiglio Rabin Todd & McGrath's (PRTM) Performance Measurement Group. The study surveyed 120 subscribers to PRTM's online benchmarking service from seven industries (aerospace and defense, automotive, chemicals and applied materials, computers and electronic equipment, medical products, semiconductors, and telecommunications). Results show that companies achieving portfolio management excellence, or Stage 3 in PRTM's product development model (see "Average Annual Revenue Growth Rate," below), experience more than 50 percent faster revenue growth than Stage 2 companies, based on data collected from 1996 through 1999. Companies that have reached only the functional management stage lag Stage 2 companies by 33 percent in revenue growth. No companies in the study reached Stage 4.

AVERAGE ANNUAL REVENUE GROWTH RATE

Categorized by the maturity of a company's product development practices



Best Practices

1. Assess your entire product portfolio. Most companies are moving from Stage 1 to Stage 2 by focusing on customizable processes and cross-functional teams, according to Michelle Roloff, chief analyst for PRTM's Performance Measurement Group. To get to Stage 3, Roloff says, "Companies must make decisions with the entire product portfolio in mind, not individual projects."

2. Use Web-enabled tools to involve everyone. Incorporating such technology will supply consistent information (like accurate roll-ups of resource availability and project status updates) to all parties. Top companies work to create a cross-functional decision-making process, involving all company functions (from marketing and customer service to engineering) in the product development effort.

3. Allow for process changes. Top performers believe that product development processes continually evolve and allow for quick changes. "Design processes used to be much more rigid," Roloff says. "Today companies should provide guidelines for product development, but leave room for customization of individual steps and tasks."

4. Learn from the experts. It can take one to two years for new practices to take hold in an organization. Don't try to learn everything internally. Start by comparing your current capabilities to peer companies and by identifying gaps in performance between your company and best-in-class performers in your industry.

SOURCE: PRODUCT DEVELOPMENT BENCHMARKING SERIES, PRTM PERFORMANCE MEASUREMENT GROUP, 2000

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SECURITY

Who Let the Bugs Out?

By Lauren Capotosto

EVERY TIME YOU think you're on top of security issues, another bug comes along to bite you. In a computer security report conducted last year by the Computer Security Institute and the San Francisco Federal Bureau of Investigations Computer Intrusion Squad, 70 percent of respondents (mostly large corporations) reported that they had experienced unauthorized use of computer systems in the past year.

To help you stay abreast of software vulnerabilities, The National Infrastructure Protection Center, a division of the FBI based in Washington, D.C., publishes *CyberNotes* every two weeks; the free online newsletter informs IT and security professionals of the latest bugs, holes and patches. *CyberNotes* details vendor or operating system, software name, potential vulnerability, identified patches, common vulnerability name, level of potential risk and exploit scripts, if known. The Dec. 4 issue, for example, indicates that for software Adcycle 0.77b, "a vulnerability exists if the installation is not completed, which could let a remote malicious user obtain the management user name/password," a helpful tidbit for security professionals. *CyberNotes* compiles information from sources like @Stake, Bugtraq, eSecurityOnline.com, Microsoft Security Bulletin, Securiteam and Security Advisory. To learn more about how to track these pesky bugs, check out www.nipc.gov/cybernotes/cybernotes.htm.



SECURITY

Think Like a Hacker

IF YOU WANT to beat the attackers, you've got to think like a hacker. That's the premise of computer security company Foundstone's four-day Ultimate Hacking course. Using Foundstone's self-contained network to hack into simulated systems, class participants learn the vulnerabilities of their own systems through the eyes of an attacker. This perspective reveals a new world of weaknesses, says George Kurtz, CEO of the Irvine, Calif.-based company. "We've actually had people run out in the middle of class to call their system administrator to make some changes on the fly," he says. But mostly they're riveted to their seats by topics like foot-printing, Unix security, protecting Windows, and firewalls and other esoteric techniques, all covered in the \$3,500 class.

Steve Peters, a senior security engineer in Herndon, Va., for the Chicago-based Marchfirst, a global professional services company, took the course last November because he was looking for ways to protect his company from cybersabotage. "The course gives you the ability to keep ahead. I was definitely able to make changes and recognize different avenues that malicious people could take if they wanted to break into the network," he says.

To ensure that students use this newfound knowledge for good, Foundstone requires them to sign legal forms indicating they will use the techniques only for internal purposes. A signed piece of paper is not going to stop a hacker bent on mischief, although the price tag of the course might.

—Lauren Capotosto

"The typical virus writer is a 15- to 24-year-old male. They call themselves Dark Avenger and Nowhere Man because there's something missing in their lives. They grow up, go to university, meet girls, and they stop writing viruses."

—Graham Cluley, senior technical consultant, Sophos



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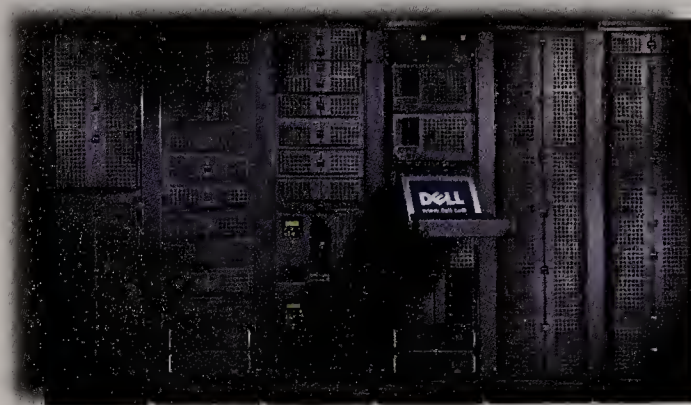
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MOBILE WORKFORCE

Dangers @Home

By Brion O'Connor

OUT OF SIGHT, out of mind? Not a wise approach for company managers with employees working on the road or from home. While great strides have been made in creating a safer office environment—from ergonomically correct chairs and keyboards to eye-friendly computer monitors—the trend toward four-wheeled home offices is offering a whole new frontier for workplace injury and ailment.

"Office is a kind of loose term these days," says Wayne Maynard, product director for ergonomics for Liberty Mutual Research Center for Safety and Health in Hopkinton, Mass. "People don't have to be in a cubicle or in one place to do business anymore. So we're also talking about different types of [workplace] hazards—vehicles, cell phones, digital wireless technology, laptop computers. For example, you hear of people working on computers while they're driving."

In this brave new world of high-tech communications, companies are eager to take advantage of the flexibility provided by equipment that gives employees more mobility. But how can businesses manage the safety of people they don't see?

The challenge for companies is to recognize hazards, enhance safety programs to include offsite employees, budget for safety accessories and develop strategies to make sure employees work safely with the equipment provided. Technology that takes workers away from the office will continue to develop. "That's going to make managing safety, and managing and assessing risk more difficult," Maynard says.

But a company's obligation to ensure safety remains. Managers must now consider a variety of assessment tools to help satellite employees create a safer work

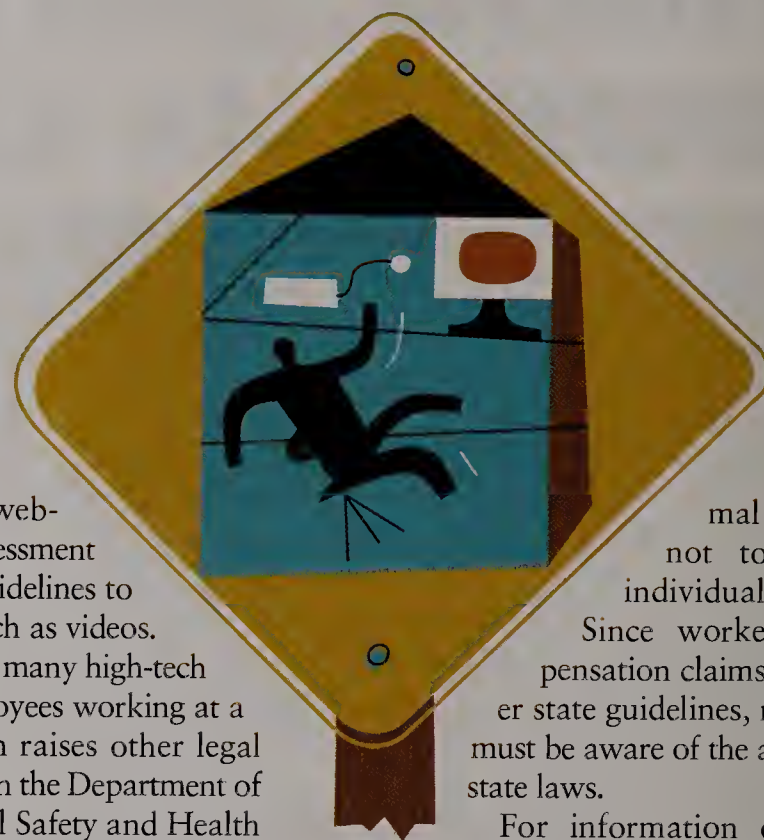
environment, from websites providing self-assessment questionnaires and guidelines to training programs, such as videos.

Maynard adds that many high-tech companies have employees working at a client's offices, which raises other legal concerns. Officials with the Department of Labor's Occupational Safety and Health Administration (OSHA) raised eyebrows last year when, asked for a ruling by a Texas credit company, determined that organizations are liable for their at-home workforce. However, OSHA officials have since revised that ruling and adopted a for-

mal policy not to inspect individual homes.

Since worker's compensation claims fall under state guidelines, managers must be aware of the applicable state laws.

For information on ergonomics in the traditional office, on the road or at home, contact the National Institute for Occupational Safety and Health at 800 356-4674, or visit the OSHA website at www.osha-slc.gov/ergonomics-standard/index.html.



SECURITY

Upcoming Events

INTERNET SECURITY POLICY FORUM: MARCH 22, 2001 In partnership with the U.S. Department of Commerce's Critical Infrastructure Assurance Office (CIAO), *CIO* and sister publication *Darwin* will host this forum at the U.S. Chamber of Commerce in Washington, D.C. It will focus on information assurance risks facing the business community today, as well as international and domestic solutions. Harvard Law Professor Arthur Miller will moderate a discussion among congressional leaders, security experts and business executives. *CIO* magazine Editor in Chief Abbie Lundberg will also participate. For more information, visit www.cio.com/webcast.

GLOBAL INFOSEC 2001: MARCH 30, 2001 The United Nation's Working Group on Informatics, the U.N. IT Task Force and AIT Global will present this conference on information security and e-commerce. It will cover encryption, security measures and procedures, antivirus and anti-hacker measures, webpage protection and interception capabilities and countermeasures. It will be held in the U.N. Conference Center in New York City. For more information, contact AIT Global at 631 269-6713.

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—Anonymous



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On the Move

Compiled
by Tom Field

Pizi Moves to Level 8



Anthony Pizi

software engineering was the wave of the future—even if he did have to settle for a

WHEN HE STARTED at Merrill Lynch as a programmer/analyst in 1983, Anthony Pizi actually took a pay cut. He'd been in mining engineering but thought

\$22,500 starting salary. Seventeen years later, having worked his way up to CTO of the company's Private Client Architecture Group, Pizi laughs and says, "I think I made the right decision."

Now he's made another. As of Jan. 1, Pizi joins Level 8, a Cary, N.C.-based e-business software vendor, as chairman and CTO. Pizi will provide strategic direction for all of the company's products, as well as offer direction on the

creation of new products and services. "Hopefully, I won't be involved in day-to-day operations," Pizi says. "At Merrill Lynch, there were 850 people in the [IT] organization, and it seemed like I just moved from situation to situation. I did not see the strategic elements [of the job]." At Level 8, the bulk of Pizi's job will be strategy. "The challenge is going to be execution," he says. "We have to make certain we have good technology staff and partnerships. We're going to be selective about who we partner with."

Reflecting on his 17-year career at Merrill Lynch, Pizi says he's most proud of the culture he helped develop in his organization. "I think I'm leaving a legacy of a meritocracy," he says. "We were progressive in the way we approached technology and teaming. The culture was diverse and highly respected—and, hey, I came up through the ranks, right?"

Although Level 8 is based in North Carolina (with offices in Denmark, France, Germany, Italy, Sweden and the United Kingdom), Pizi will operate out of a New Jersey office.

Player's Guide

Robin Alston

Vertac Corp.

Alston has joined Boston-based Vertac as CTO for the marketplace service provider. Alston will refine and drive the technology behind the company's Marketspeed Solution product, which enables target-marketing through an e-marketplace.

Stephen C. Hassell

Newport News Shipbuilding

After almost three years as CIO at Newport News Shipbuilding, Hassell has been promoted to CIO and vice president of the Newport News, Va., shipyard. In this role, Hassell is responsible for all aspects of the yard's IT systems, including network infrastructure and data center operations.

George Henriques

J.A. Webster

Henriques has joined J.A. Webster as CIO of the Sterling, Mass.-based animal-health pharmaceutical wholesale distributor. Previously, Henriques led IT at HighGround Systems in Marlborough, Mass.

Chris Moody

Aquent

Recently named CIO at Aquent, a Boston-based talent agency for design and Web professionals, Moody will develop new systems and programs to make it easier for clients and staff to do business with the company.

Dan Wakeman

ElastomerSolutions

ElastomerSolutions, a Horsham, Pa.-based online trading community for the elastomers industry, has named Dan Wakeman as its new CTO. A veteran IT executive, Wakeman previously served as CTO at DuPont Dow Elastomers.





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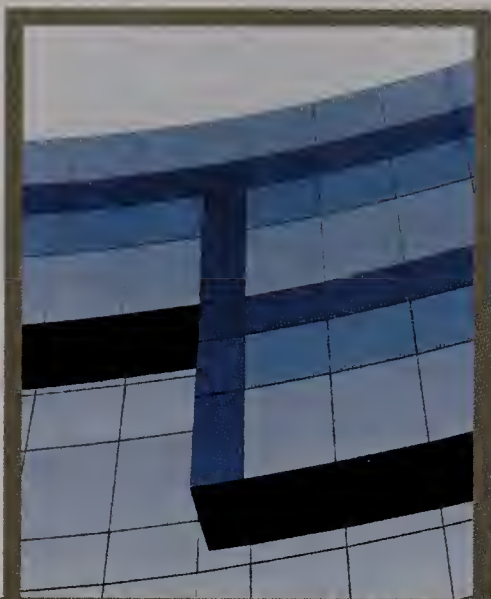
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< Photos taken in St. Petersburg, Florida at the online subsidiary of the Home Shopping Network. HSN.com recently converted from a mixed platform to a Microsoft and Intel-based e-commerce solution.



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Davenport on...

Strategic Sourcing Lives!

Where's the gold in them thar e-markets?

BY TOM DAVENPORT

WHEN I FIRST BEGAN to research e-commerce networks and markets with two colleagues (Jeff Brooks and Sue Cantrell) a year ago, I was not quite as bullish as they. I wasn't as sure that e-markets would transform business-to-business relationships, or as optimistic that huge savings from purchasing efficiencies would be created. The diligent reader of this column (Joe is his name, I believe, and I'm very grateful to him) will remember that when I wrote about the topic in the April 1, 2000, issue of *CIO* ("Nets Upon Nets"), I was a little schizophrenic. That column was a dialogue between the skeptic and the visionary observer of e-markets, and although I said I thought the visionary won the debate, Joe might have observed that there were more skeptical than visionary paragraphs.

In the (much less important) world outside of my own mind, it appears that the skeptics are winning out. It wasn't that long ago that I could read a press release each day on the formation of a new e-market; now I can read a daily dose of negativism in the IT and e-commerce press about these nascent companies.

Certainly there was potential for these e-markets to reshape B2B commerce. They offered access to more suppliers and cus-



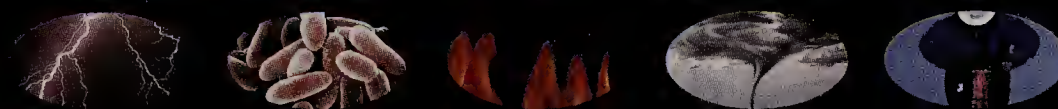
tomers, the potential exchange of virtually all types of information, and the ability to dynamically price goods and services through mechanisms such as auctions and yield management. The development of e-market standards across entire industries offered the possibility of new communities of commerce in which it would be just as easy to transact with another company as with your own. Because there were some real advantages to independent e-markets and because the world loves to think that a bunch of e-Davids could slay the B2B Goliaths, the whole concept took wing with reporters and equity analysts. It didn't hurt that B2B e-markets came along at about the time that business-to-consumer businesses were flagging a bit.

But we were all being a little naive about how B2B e-markets would take off. They have not taken off—at least most of them aren't thriving, and some are beginning to die. Our data, based on a sample of 120 e-markets, suggest that

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the median e-market is doing only 175 transactions a month, with a median value of \$6,500 per transaction. That adds up to about \$1.2 million a month passing through the market. Transaction fees are the primary means of getting paid in e-markets, and they are at best around 5 percent or so. That means that the average e-market is getting only about \$60,000 a month in revenue, which will barely pay for the maintenance of the foosball table.

The big guys—that is, large companies that buy and sell

The big guys—that is, large companies that buy and sell within existing markets—have moved in, even though thus far there is little booty to plunder.

within existing markets—have moved in, even though thus far there is little booty to plunder. They have developed their own e-market consortia working with other players in their own industries. It was only natural that large companies in, say, the oil business, would want to develop their own marketplaces rather than hand over big (well, they thought they would be big, and maybe they will be eventually) transaction fees. In March, April and May of 2000, consortia e-markets were formed in the automotive, aerospace, forest products, utilities, food, airline, rail, energy, chemicals, hospitality and computer industries. If you were an independent e-market, would that lineup intimidate you? I suspect it will scare many independent e-markets into selling themselves or their services to consortia.

If competition from e-market consortia weren't enough, there are three other factors that have inhibited e-markets' growth.

Integration is a huge issue in e-markets. It refers to the ability of one company to integrate its buying and selling systems with those of the e-market, or with other companies that are participating in the market. Certainly some progress has been made in the ability to connect interorganizationally; companies such as WebMethods have eased the way somewhat with integration tools. Eventually, companies will undoubtedly be able to issue purchase orders through their own enterprise systems, and have them seamlessly pass through an e-market to the enterprise system of another company. But don't hold your breath while this is all being worked out; it will take many years.

The difficulty of implementing information and process standards. Sure, you can get a bunch of well-meaning people together from various companies in an industry, and they may all agree that a "9 millimeter stainless tube" will mean just that. Several industries—most notably the electronics industry through RosettaNet, an early e-market consortium—have already done so. But it is another matter altogether for every-

body in an industry to actually implement common information and processes. That would mean reengineering an awful lot of businesses. It will be even harder for companies to agree on how to describe highly engineered or complex components. Even if these steps could be accomplished, there are undoubtedly dissidents within the organization who will say, "Why should we make all our processes and information the same as our competitors—so that we can compete only on price?" Sometimes we should listen to such dissidents.

The relationships companies have developed with their suppliers. Of course, they're not really a problem from any other perspective; they are rather a great asset. Which is why companies don't want to dissolve them in favor of an e-market in which they can save a few bucks by purchasing from

suppliers they don't know. My favorite example of this is Toyota, which was asked by the Big Three automakers to join Covisint, their e-market. Toyota managers asked themselves, "Should we dissolve the supplier relationships we've worked on for decades, which are a critical aspect of our quality, which is a critical aspect of why we're a great car company?" They considered the issue for at least a second or two. Their response was, "OK, we're in...for office supplies and a few nuts and bolts." It would have made zero sense for Toyota, or any other organization with close supplier relationships for key components, to give up those relationships for a few dollars or yen saved through an e-market.

The end result of these factors is that strategic sourcing is alive and well. Companies continue to buy much of what they need and sell much of what they make to long-term trading partners with whom they have cultivated deep relationships. To be sure, many companies are developing private extranets to facilitate connections with existing partners. These private networks are similar to electronic data interchange connections, but they involve no value-added network intermediary and allow for a much broader range of information types to be transmitted. They'll be particularly important in the next phase of interorganizational relationships, in which companies will truly collaborate, not just exchange information. The private networks do involve the Internet (albeit in a private form), but they don't involve revolutionary change. Instead they are just another step in a long efficiency dance involving companies and the other companies with which they do business. **CIO**

Tom Davenport is the director of the Accenture Institute for Strategic Change and a distinguished scholar at Babson College. He welcomes reader comments at davenport@cio.com.



PHOTO BY FURNALD/GRAY

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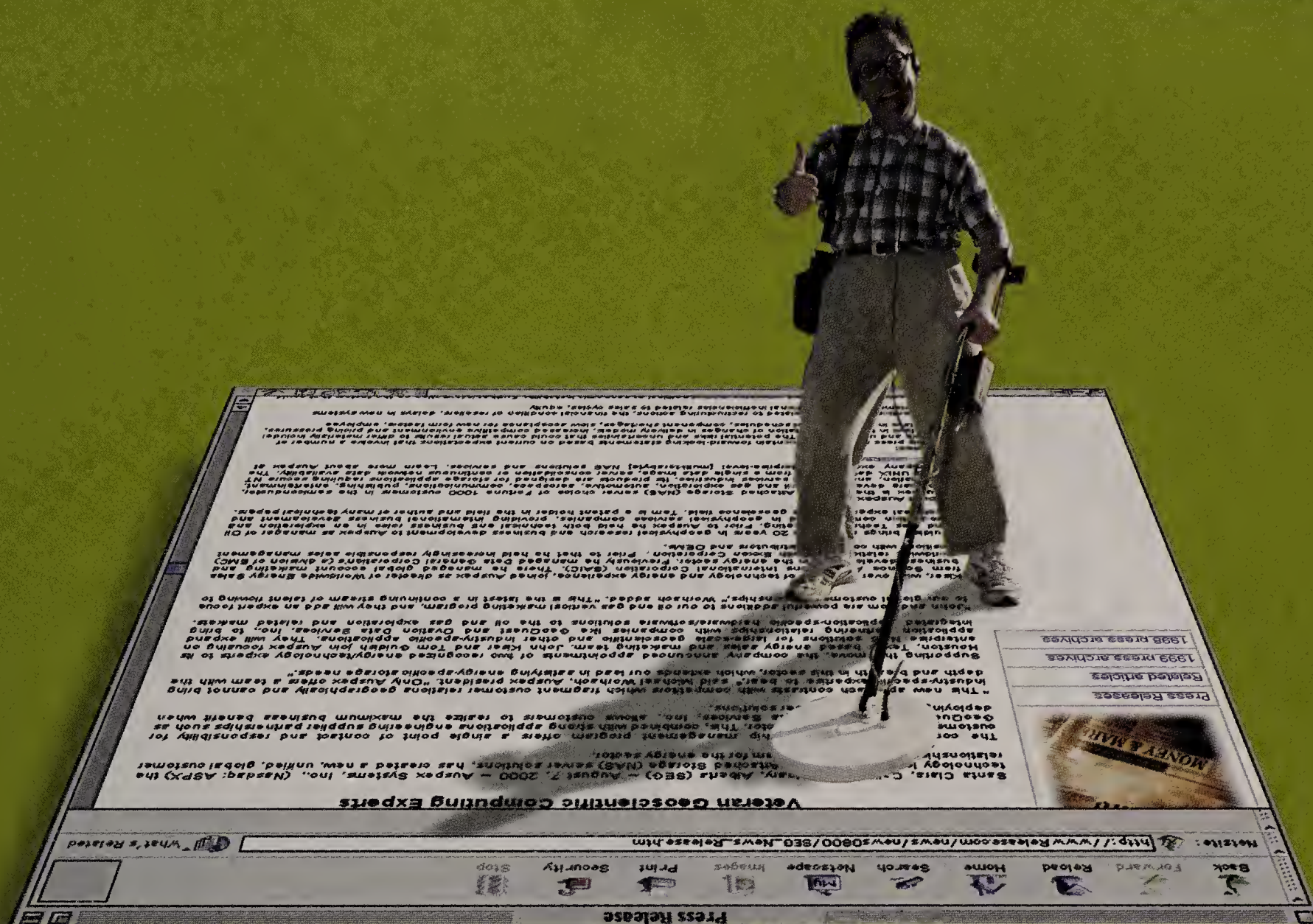
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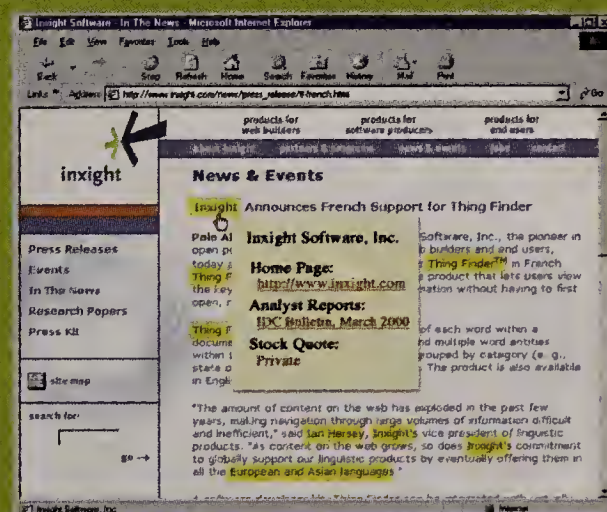
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Uncertain times pose a defining test for any leader

BY CHRISTOPHER HOENIG

MORE THAN A CENTURY AGO, Karl von Clausewitz, the legendary developer of Prussian military strategy, coined a phrase to describe the extraordinary leadership challenges faced by commanding generals. He called it the “fog of war.” This phrase represented a set of complex factors, including pressure for quick decisions, inadequate or distorted information, stress, anxiety and fear, the crushing impact of loss of life, and the difficulty of communication with others. Von Clausewitz observed that these factors combined to cloud the thinking and decision making of leaders at critical times.

In contemporary business and technical leadership we call this “managing through uncertainty” or “leading through change”—though no phrase matches the power of the original. Yet whatever you call it, working successfully through the fog is a defining test for any leader.

There are many different situations that can make you a leader in the fog, such as the first few months at a new job in a financially threatened company or leading a strategic response to a new competitor. When you feel your mind go fuzzy, your alternatives narrow, your creative juices dry up



and your tension rise, you know you're in the fog.

The thickest fog I've ever confronted is in building a new company from the ground up. Even after starting with a relatively clear concept and months or years of planning, the fog settles in the moment you actually begin. In the first three to six months, the product/service focus, business model and market analysis might change four or five times.

Whenever I have to lead through high degrees of ambiguity and uncertainty, I use an approach long tested by the Marines and fighter pilots to guide their decision making in complex, life or death, disorienting situations. It is called the OODA (pronounced “ooda”) loop: observe and orient, decide and act. I've used it below to organize the lessons and techniques I've found useful.

Observe and Orient

Observing and orienting involve getting accurate information,

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multiple points of view and a frame of reference that allows you to navigate even in the midst of uncertainty. It also means developing a dynamic view of an entire situation so that you do not get stuck in static thinking or make the mistake of interpreting new situations solely in light of similar situations you've faced before. To effectively observe and orient, you need to:

- Get the lay of the land. Understand the terrain, the players, the trends and where you are in relationship to everyone else. I read voraciously, get the scoop from intelligent colleagues and friends, and listen to both practitioners and pundits. Using that information, I try to form—and continuously update—a view of the situation that incorporates a longer-term strategic perspective as well as the immediate tactical reality.

Nothing accentuates the tension and anxiety of working in the fog like a lack of objectives.

- Generate a frame of reference. Have your own mental construct that defines boundaries and points of navigation even when there appear to be none. Early on in a new business, our team developed a picture of the industry and a plan for how our business would likely evolve during the next six, 18 and 36 months. With regular updates, this served as a stable high-level frame of reference we could use to interpret all the changes taking place around us.

- Conduct reconnaissance. Get as much meaningful information as possible, then double- and triple-check it for reliability. My CIO and I play a game every day scanning the Web for potential competitors: The person who can frighten the other one most wins. Every month or so, we find a company that makes our collective stomach sink. Then we systematically research it and process how its approach compares to ours. This always involves sending someone on a reconnaissance mission, no matter where the company is located.

- Communicate, communicate, communicate. Keep a constant flow of communication from multiple sources and expect to be surprised and respond to last-minute changes. I encourage our board members to send us e-mails about potential partners. Employees saturate me with ideas about new approaches. My partners and I conduct daily, weekly, monthly and quarterly reviews to ensure we're talking about all the right things all the time.

Decide and Act

Deciding and acting moves from absorbing, filtering and processing information to calculating and executing both bold and incremental actions to achieve an objective. Of course, the problem with the fog of complex problem-solving environ-

ments is that objectives may frequently change. To effectively decide and act, you need to:

- Determine your goals and objectives. Nothing accentuates the tension and anxiety of working in the fog like a lack of objectives. In running our new business, we rapidly evolved a set of objectives over several months and ended up with six strategic goals that drive all our goal setting, performance measurement, risk assessment, and organizational roles and responsibilities.

- Have a plan and be willing to change it. Know where your opportunities and risks are likely to be. Then have victory and escape routes planned. My businesses all had plans from the beginning, but the process of changing and adjusting our thinking was as important as the plan itself. We talk weekly about

how it needs to be adjusted given tactical conditions, resource availability, developing opportunities and emerging risks.

- Develop multiple scenarios and contingencies. Make deliberate decisions. I spend time constructing worst- and best-

case scenarios, but the ones I work on the hardest are "minimum required" and "maximum possible." Minimum required means the least number of things that need to be done in order to get to our next line-of-sight result. Maximum possible adds in the known opportunities that could turn into windfalls if everything goes right. I try to zero out the risk of worst case, capture most of minimum required very early and then work systematically to increase the probabilities of getting to maximum possible or best.

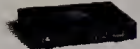
- Act and react. Make bold, deliberate moves. Ulysses S. Grant attributed his maturity as a leader to finally realizing, just before one hair-raising battle, that the other guy was just as uncertain and afraid as he was. Always remember, you're not the only one in the fog. So work your own plans, look for the other guy and make the bold moves that will require others to respond to you and not vice versa.

When you find yourself in a leadership situation and the fog is settling in, remember the OODA loop. Systematically work through its cycles as best you can. You may find the fog more comfortable to work in and even clearing up faster than you expect. **CIO**

Send your own tales of leadership in the fog to leadership@cio.com. Christopher Hoenig has been an entrepreneur, government executive (director for information management and technology issues at the GAO), consultant (McKinsey & Co.) and inventor, and is author of *The Problem Solving Journey: Your Guide to Making Decisions and Getting Results* (Perseus Publishing, 2000). He is now chairman and CEO of Exolve in Washington, D.C., focusing on next-generation Web-based problem solving.



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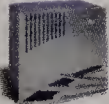
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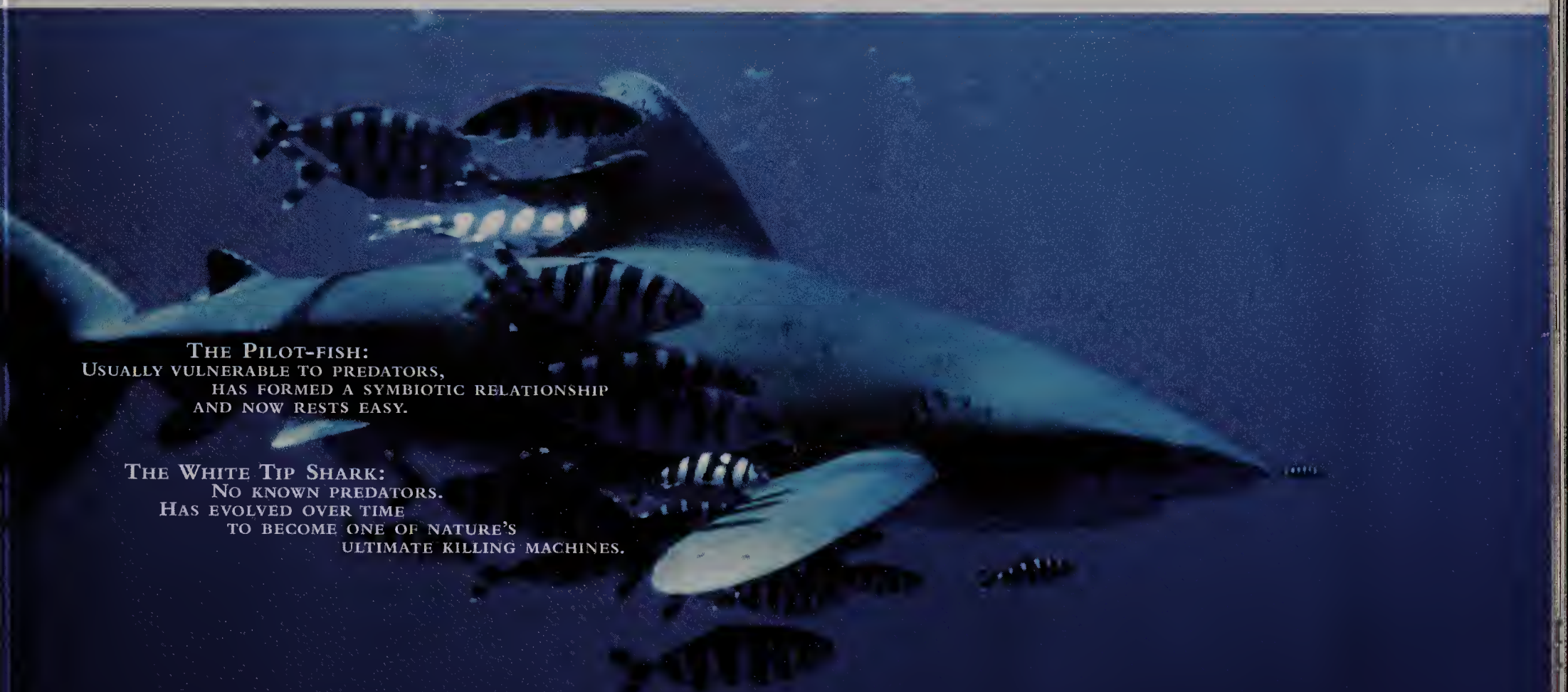
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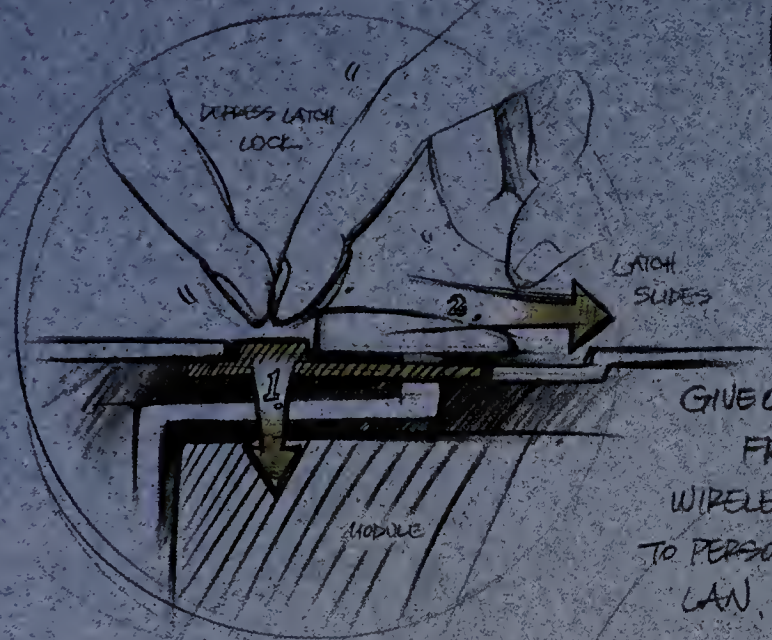
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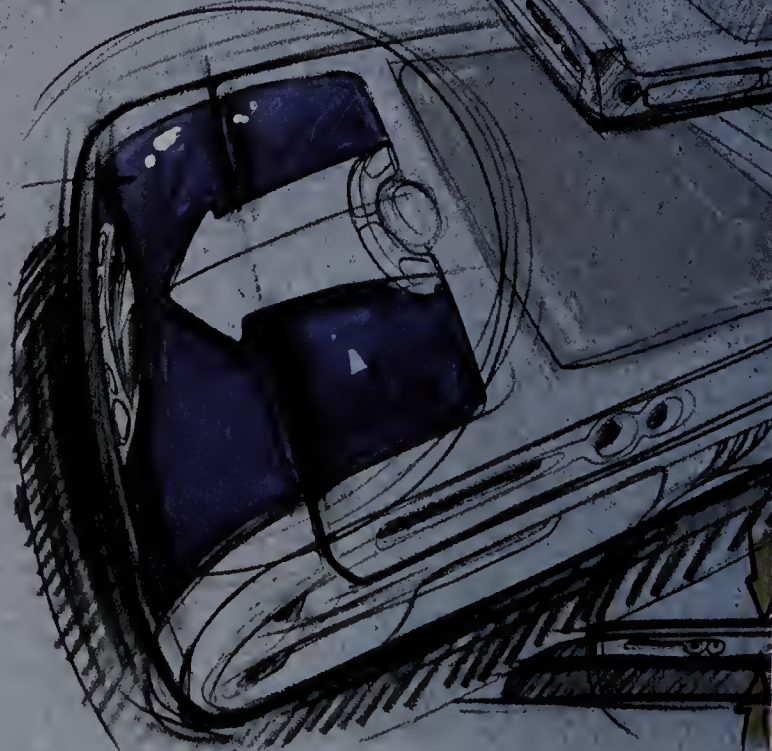
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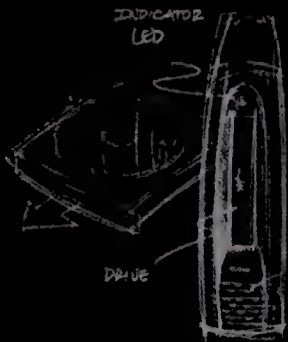


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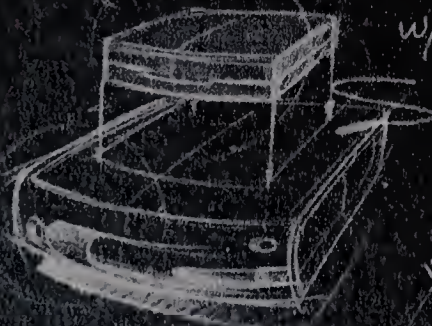
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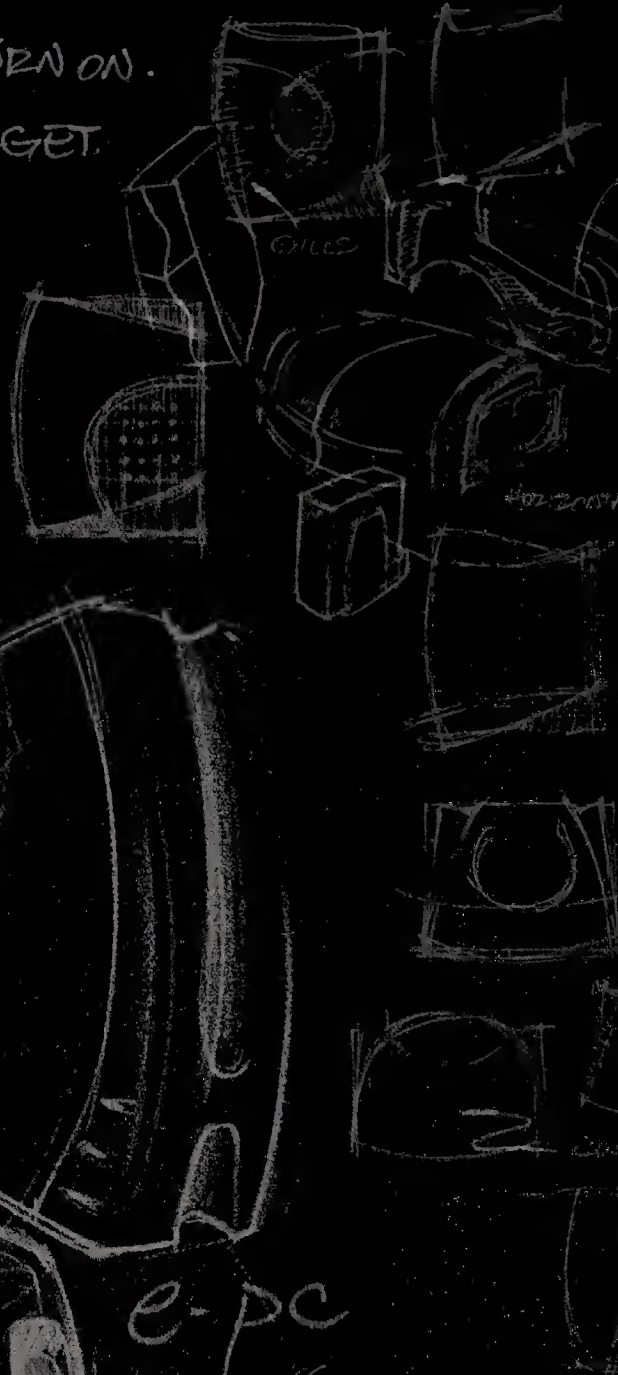
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PASSPORT

DOING BUSINESS GLOBALLY

Edited by Contributing Editor Malcolm Wheatley. Send your views and ideas on global business to him at passport@cio.com.



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Sound Systems

Luxury brands have a reputation for “fat and happy” back-office functions. Bang & Olufsen breaks the mold. **BY MALCOLM WHEATLEY**

TO BOTH HI-FI BUFFS and trendy interior décor types, Danish consumer electronics company Bang & Olufsen needs little introduction. Renowned for the technical innovation of its products as much as for their starkly modern styling, Bang & Olufsen’s televisions and hi-fi units (typical price: US\$5,000) are coveted all over the world.

Such is their appeal that export sales account for more than 80 percent of the output of the company’s factory in Struer, in northern Denmark—high even by European standards. The company exports

mostly to the rest of Europe, although even Japan has 47 stores selling Bang & Olufsen products, a feat akin to selling refrigerators to Eskimos.

But walk into a Bang & Olufsen shop, and it’s likely that you’ll walk out empty-handed, returning home without the TV or stereo of your choice. This is not because of inventory control foul-ups but because a growing number of Bang & Olufsen stores hold only display inventory so that the company can build to order as many products as possible.

This approach is backed by systems that pull

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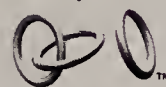
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together some of the latest thinking in supply chain management and retailing today. While other companies, such as Dell Computer (see "Fine Line," *CIO*, Feb. 1, 2000), have built electronic links between end consumers and factories, Bang & Olufsen has pulled the dealer into the loop too. Select and configure the model of your choice, and it arrives five days later—a pretty neat trick, considering that three of these days are taken up by transportation time. (This doesn't apply in the American market, which is served by a well-stocked warehouse in Newark, N.J., and accounts for 5 percent of sales.)

Thirty-five percent of material requirements reach Bang & Olufsen's production lines without an order being formally generated at all.

Building and running the systems to bring this about is the responsibility of IT Manager Ole Damsgaard. Inevitably, he explains, much of the focus hitherto has been on compressing the preshipment supply chain. For example, SAP R/3-based materials requirements planning (MRP) is run every two hours during the day, as new orders arrive from the company's 14 national sales offices and 2,172 retailers.

In the factory, products are built on automated assembly lines and ergonomically efficient workstations that embrace state-of-the-art, computer-integrated manufacturing. The objective, says Damsgaard, is to do more than just provide information to management about which product is where in the assembly process. Instead, the goal is real manufacturing functionality. "Operatives scan the bar code of the TV they are working on, then scan the component they are installing—such as a picture tube, for example—and the system confirms that it's the right component for the right product," he says.

And little is left to chance in making sure that those components arrive on time. The same two-hourly MRP run that updates the production schedule also outputs future component requirements to a data warehouse from the SAS Institute of Cary, N.C. From this, a custom-built system extracts the material requirements and posts them on a webpage for suppliers to download in to their own planning and production systems.

The result: Although paper- and EDI-based orders still account for 65 percent of material requirements, 35 percent of requirements reach the production lines without an order being formally generated

at all. Suppliers are given a minimum and a maximum level of inventory that they must maintain onsite at Bang & Olufsen. Within that range, they are free to organize their own manufacturing schedules to suit their own capacities and constraints.

Outsourced Development

As the operation of the supply chain upstream from the factory gate became slicker, attention turned to improving operations downstream. In April 1999, Damsgaard charged a working party with fleshing out the specifications for an Internet-based e-commerce system that would directly link the Struer headquarters with every Bang & Olufsen retailer around the world. There were several objectives, with improved product configuration high on the list. Damsgaard wanted online customers to be able to graphically configure and order valid combinations of products that would be available in their particular national market. "Minutes later, the system can be going into production

AT A GLANCE

Changing Channels

The Pioneer: Since 1925, Bang & Olufsen has been building its reputation for innovation and style. Today, the company's products are sold in 40 countries through a network of 2,172 dealers. The company employs 2,800 people, mostly at its HQ in Struer, in northwest Denmark, and had 1999/2000 sales of 3.72 billion Danish kroner (approximately US\$460 million).

The Challenge: Find a way to combine some of the best elements of electronic commerce, mass-customization, computer-enhanced retailing and automated post-sales support—without alienating the local dealers who are critical to the company's success.

The Solution: A multilingual Web-enabled configuration and online ordering tool, complete with post-sales support facilities.

here at Struer," says Damsgaard.

Coding on the system began in August 1999 in cooperation with Maersk IT, a Web solutions and Internet technology company in the Maersk Data Group. (Maersk Data is a subsidiary of A.P. Moller Group, one of Denmark's largest companies.) Their task: Link together a disparate clutch of best-of-breed applications that included Microsoft's SQL Server; Baan's e-commerce product configurator; SAP's R/3; IBM's DB2; and sales administration software from Navision Software (now NavisionDamgaard) in Denmark. "It was very, very important to us to have one main contractor," stresses Damsgaard.

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The system went live just four months after work began, initially on a test basis with nine retailers in Germany, Spain and the United Kingdom. It's now being rolled out on a global basis—a process Damsgaard expects to take two years. In addition to product configuration and order-placing, the system allows retailers and after-sales service shops to look up product information; download manuals, handbooks and service information; order spare parts; and perform guaranteed registration.

It's this breadth of functionality that has imposed the two-year rollout period, by generating a huge translation and storage task. "It's a language-versioned system," explains Damsgaard, reeling off the versions so far created: English, German, French, Spanish, Italian, Dutch and the Scandinavian languages. Eventually, Japanese and other language versions will be launched as well.

Indeed, the specificity of the system offers one of its biggest boons. There's a thriving cross-border gray market in Bang & Olufsen products—not every product is launched in every market at the same time (and at the same price)—and the online configurator imposes restrictions of what can be legitimately ordered: German dealers, for example, can't order Danish products.

However, not every aspect of the system as originally envisaged will see the light of day. At one point, a wireless application protocol (WAP) link was contemplated, raising the possibility of Bang & Olufsen dealers logging on to the system from customers' homes. But, as WAP's limitations have become clearer, its appeal has diminished. "WAP technology isn't good enough right now," concludes Damsgaard. "It needs better screens and faster connections."

London-based Contributing Editor Malcolm Wheatley can be reached via e-mail at malcolm_wheatley@compuserve.com.

Q&A | JULIA COLLINS

The Kraken Wakes

KNOWLEDGE MANAGEMENT'S dirty little secret: However much you invest in high-tech knowledge banks, employees in search of an answer tend to make their first port of call the folks they know from the water cooler.

Giant consultancy PricewaterhouseCoopers is no different, concedes Julia Collins, its London-based head of global knowledge management. While PWC has considerable investment in formal knowledge management databases, the Kraken, an informal and unofficial Lotus Notes e-mail list, has been garnering more attention lately. Named after a mythological sea monster in a poem by Lord Tennyson, the Kraken is a sort of global glue, sharing knowledge across national borders.



Q: What exactly is the Kraken?

A: It's a discussion database—but one that works through e-mail. It's there every morning when you log in, and you look at it if you've got time, and you don't look at it if you haven't. It builds connections to people in very diverse parts of the world who do each other favors by providing information. It doesn't compete with our more formal knowledge management systems; it's more additive. The formal knowledge management systems capture and share explicit information—and generally information that is well documented and formatted. With the Kraken, people ask questions; other people answer those questions. Everybody on the mail list sees all the traffic: the questions and responses, and the responses to those responses.

Q: Who uses it? And for what?

A: About 600 people are on the list at the moment. They tend to be reasonably senior people, usually asking quite complex questions: "I'm trying to do this particular thing—has anyone done it?" or "Where have we done it, and what did we encounter?" That kind of thing. And they tend to ask those questions after they have exhausted the easier options, especially within their own countries. Alternative approaches to capturing knowledge, such as post-engagement reviews, don't really replace the need to chat through a problem. For that, the Kraken is very good. The information passed is more informal and context specific than the documented knowledge that we hold in most of the databases.

Q: Was it complicated to set up?

A: It was really, really straightforward to set up. It's a simple mail group under Lotus Notes. To be added to the mail list, you just send a request asking to be added. There wasn't any prior approval required to set it up, and it doesn't really require funding. It just works.

—M. Wheatley

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NETHERLANDS | Power Off

Setting up in Amsterdam? Check with the electricity provider before signing a lease. Nuon NV, the company providing power to the Dutch capital, says there is capacity shortage on the electricity network.

"We have to double the capacity of the network in the Amsterdam area," says Peter Knoers, spokesman for Nuon. As a result, IT-intensive businesses are being wait-listed before they get power. "If a company relocates today, we can't provide power tomorrow. The wait will be a couple of months," says Knoers.

Amsterdam is a growing center for Internet and telecommunications companies, and the Netherlands' most important Internet hub is in the southeast of the city. Nuon, which has set up a special task force to expand its network, aims to have the job done in three years. In the meantime, the company is working closely with the city of

Amsterdam. "As soon as they know a company will come to Amsterdam, we are informed. That makes it easier to plan," Knoers says. —*Joris Evers*

HONG KONG | Digital Evidence

Companies doing business with China face a new worry: The Chinese legal system has yet to decide on the status of digital evidence. In Hong Kong, cases involving digital evidence are just beginning to emerge—only last year did the Customs and Excise Department begin to tackle Internet piracy cases.

"We have to prove to the court how we discovered the offense," says Vincent Poon, assistant commissioner of customs and excise. "We don't know if what we are doing now is acceptable to the court or not." Only the litigation of the cases over the next few months will tell whether the judge will accept the evidence, he adds.

Until then, say experts like Erik Laykin, president of Online

Security, a security software company with offices in Los Angeles and Hong Kong, it pays to be prepared. Establish procedures for storing and indexing digital information such as e-mail messages, then write down what those procedures are. With a standard operating procedure laid out in front of them, judges are more likely to accept evidence from a plaintiff or defendant. —*Stephen Lawson*

STRASBOURG | Cybercrime Plan

Information technology industry groups are expressing concern over provisions in a Council of Europe draft proposal for fighting cybercrime.

The draft, which could be law later this year, calls for minimum penalties on illegal data

"the draft convention could impose burdensome data preservation requirements on Internet service providers (ISPs); make ISPs liable for third-party actions; and restrict legitimate activities on the Internet."

The Information Technology Association of America, of Arlington, Va., also has reservations, says its president, Harris Miller. Miller said the council should slow down, build consensus and work with industry. "It would be helpful if there was more conformity in the laws," he says. "Setting up best practices makes sense, but when you get down to the nitty-gritty in this document, it gets tough."

Several human rights and information freedom organizations—including the American Civil Liberties Union, the United

WORLDWIRE

Strange but true: According to accident statistics, traveling by road is more dangerous in the UNITED STATES than it is in FRANCE, MEXICO, NEW ZEALAND and YEMEN.

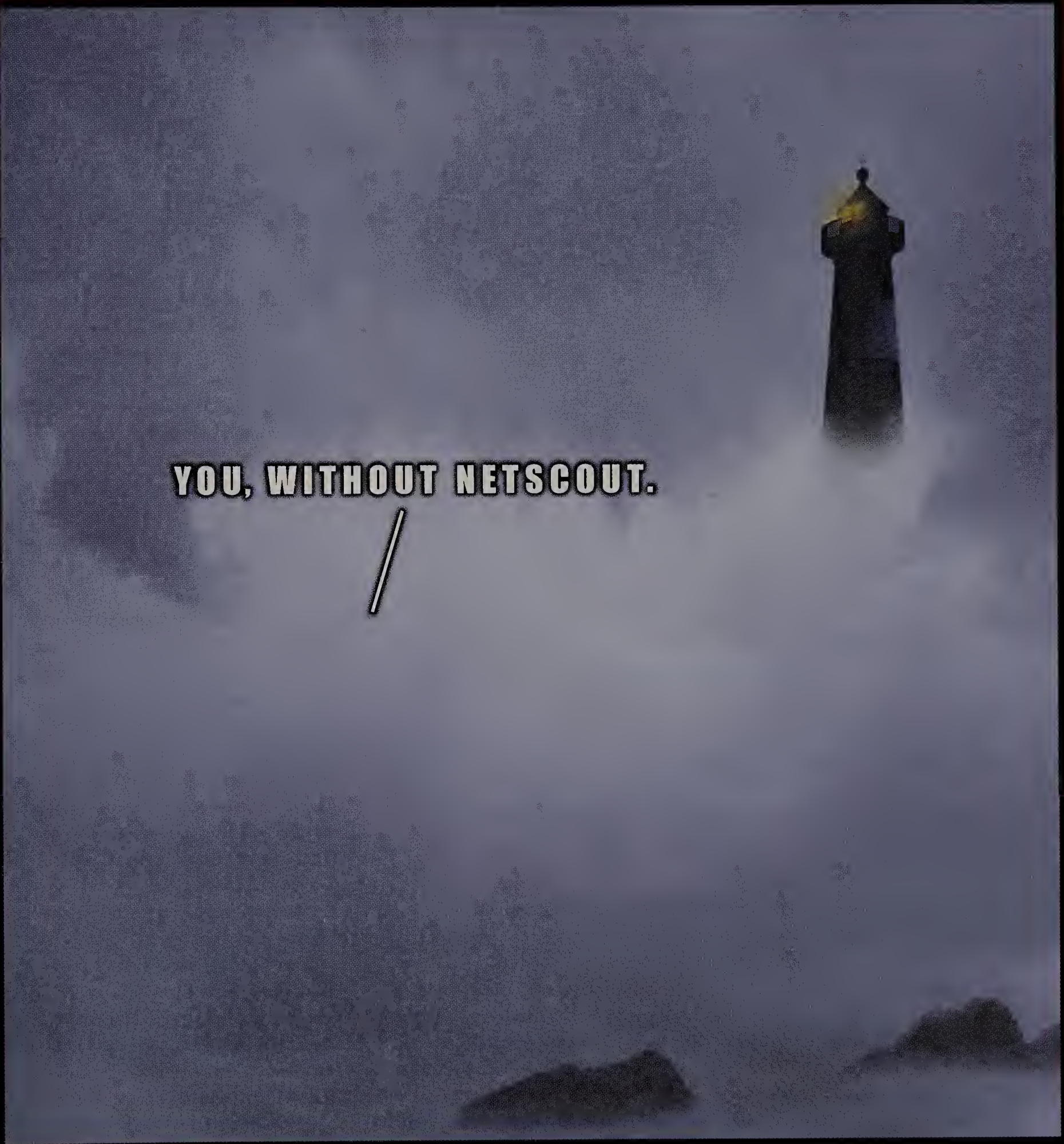
interception and computer system interference, computer-related fraud and forgery. It also prohibits the reproduction and distribution of copyright-protected material and bans online child pornography.

One group, the World Information Technology and Services Alliance, said in a statement that

Kingdom's Cyber-Rights & Cyber-Liberties group, and Spain's Kriptopolis—also oppose the pact.

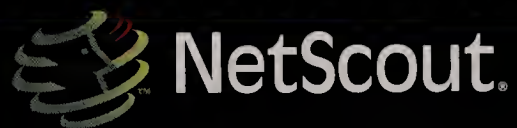
—*George A. Chidi*

Evers, Lawson and Chidi are correspondents for the IDG News Service, a sister company of CIO's publisher, CXO Media.



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WORLDVIEW | ROBERT HELLER

Connect the Dots

No matter how well a CIO wires a global enterprise, a top-down management style will keep it slow and inefficient

IT'S A WIRED WORLD. But is it a connected one? The distinction is crucial, and in the rush toward globalization, American corporations are in danger of mistaking one for the other.

The problem comes not with technology but with the organization the technology is supposed to knit together. The typical model: international divisions with well-sited regional offices managed by a combination of hardened expatriates and nationals.

These executives' titles say it all: a London-based vice president of marketing, EMEA; a Hong Kong-based vice president of technology, AsiaPac. Both, of course, with a reporting structure back to Burlingame,

Calif., or wherever headquarters happens to be (and where any decisions of note take place).

It's a cumbersome way of constructing an organization, particularly when, as now, competitive pressures require decisions to be made faster and more frequently. The usual response is to throw technology at the problem: a comprehensive and advanced technology infrastructure to animate the skeleton. But this just disguises the symptoms rather than effecting a cure.

The pyramid is not the right structure for today's global business. A better model is to think of the organization as a network held together by information flows. Instead of paying lip service to the world outside

the domestic economy, executives should be reshaping the corporation as a seamless web designed to take full advantage of all its global opportunities.

Today's business era differs markedly from the epoch of the multinationals. Originally these were little more than large American corporations with overseas affiliates primarily in Europe, some (like Ford or what is now Exxon Mobil Corp.) of considerable antiquity. The Americans have been joined in increasing force by foreign corporations, mainly Europeans and Japanese (like Honda and Daimler-Benz in autos). But that hasn't greatly altered the picture: The country of origin leads, and everybody else follows.

You couldn't ask for a stronger, or worse, example than DaimlerChrysler AG. Chrysler may have been worse managed than its publicity suggested. But management deteriorated sharply after the heavy-handed intrusion of supreme power from Stuttgart. The replacement of American top managers by Germans showed that Daimler's massive investment in information and communications technology, with duplicate electronic "war rooms" in the United States and Germany, was intended not to equalize management but to exercise the parent's will.

This parental superiority mirrors the hierarchies that still persist in the great majority of corporations. Head office dominates, and the subordinate tiers of management supposedly follow its top-down instructions. But the ongoing revolution in technology threatens this unequal and increasingly ineffective distribution of power. Now managers all the way down, acting in real-time, can share vital corporate information, feed in data, contribute and debate ideas, connect across internal boundaries—and stop acting as mere relays.

In theory, each subordinate does exactly what his superior expects with exactly the



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demand and promised results. In reality, not only are both the management process and its outcomes far messier, but subordinate managers usurp power simply by doing their jobs. Intel Corp. Chairman Andy Grove, the exceptionally powerful leader of an exceptional global exemplar, has observed how middle managers, making tactical production and marketing decisions in the real world and reacting to local pressures from customers and business economics, significantly alter the strategic stance of the corporation.

But this ad hoc exercise of power is a far cry from the deliberate involvement of man-

physical space, work is enhanced by being able to talk with an adjacent colleague, pass notes, share files, even make signals. Now, thanks to technology, this ideal can be replicated across the globe. Yet would-be global businesses are still far from exploiting the organizational implications of this next-desk potential.

Globalization is much more than worldwide sourcing of procurement, shared marketing platforms and integrated operation of centers of excellence. The ideal is to make the entire corporation a global center of excellence, in which each part contributes equally and on equal terms to the

its number of users. Curiously, although Intel's Grove agrees with this proposition, he denies that the advance of technology has greatly altered management.

"Things have changed," Grove said in an interview published in *BusinessWeek* in August 2000. "But the left brain [the technology side] says they should be galloping. The right brain [a manager's brain] says there have only been slow, gradual changes in the way we operate organizations." That's solely because the managerial right has been lagging markedly behind the left and behind the pace of change.

The nearer corporate information flows come to this next-desk ubiquity, the more power will flow from the center to the periphery—both hierarchically and geographically. Very few companies make anything like full use of the rich new resources that are created



DaimlerChrysler management deteriorated sharply after the heavy-handed intrusion of supreme power from Stuttgart.

agers in a fully wired-up and wised-up corporation—Cisco Systems is among the most publicized current examples. Benefits such as a totally wired supply chain and customer support processes contribute enormously to Cisco's operational efficiency and effectiveness. But the managerial consequences are equally momentous.

After years of hard work on its financial reporting, Cisco can now close its books every 24 hours. That ability is less valuable in itself than for what it entails: a corporatewide digital nervous system that can supply accurate and timely data to everybody who needs it. Cisco CEO John Chambers claims that he and his CFO have been enabled to offload 50 to 100 decisions that they would otherwise have made personally every quarter.

Knowledge shared in real-time is the essential element of the ultimate in communication: "next desk" accessibility. In

whole. And equality of information is indispensable to that ideal.

Dangerous delays will follow if you do not resolve the inherent conflict between democracy of information and communications, and autocracy of command and control. The conflict has to be resolved in favor of democracy. Major competitive advantage is at stake. It will be won inevitably—and perhaps permanently—by corporations that invest in the fastest, fullest and most accurate exchange of information, and that demand and get the most effective cooperation and collaboration between corporate units.

The basic proposition of this idea is that many minds working together are more powerful than one brain, however intelligent, working alone. Link minds over the system, and you'll exploit the inexorable force of Metcalfe's Law, which holds that the utility of a network equals the square of

by geographic expansion. The outposts, whether the company thinks of itself as global or multinational, are treated primarily as captive outlets for the parent's goods and services.

Act on a next-desk philosophy, however, and the focus shifts from head office to optimizing collective performance through optimal contribution (of ideas as much as profits) from all units, which you manage as a collective. The time is overdue for CIOs to take the initiative and draw up blueprints, working with CEOs and other key functions, for the globally networked, incessantly interactive and entirely interdependent business. The plans will be needed sooner than most managers think—and in this context, being first is halfway to being best. **CIO**

U.K.-based Robert Heller has been writing about global business and technology issues for more than 30 years.



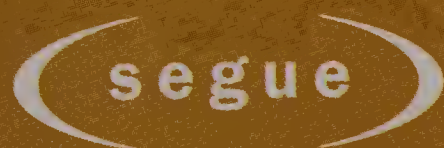
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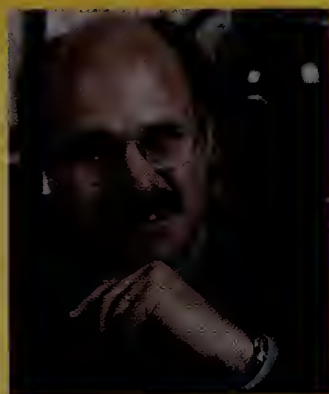
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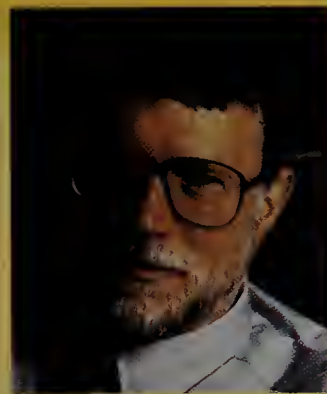
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The 2001 CIO 100 awards will recognize companies that have demonstrated innovation in a number of areas: by creating new products and services that offer potentially significant benefits in the marketplace; by markedly refining, redefining and improving relationships with outside partners or customers; or by creating and refining internal processes that enable them to stay successful in the marketplace or to take the company in a new direction.

The Symposium program explores innovation as the key to future change, growth and success. And who better to moderate our discussions and talk to us about “Innovation in an Age of Creative Destruction” than Paul Saffo, Director of the Institute for the Future? Paul believes that technology doesn’t drive change - it merely enables change. It creates new options and opportunities that we choose to exploit. To him, it is our response to technology that drives innovation and change.

Joining Paul on the main stage will be Geoffrey Moore, Danny Hillis and John Seely Brown. At last year’s Symposium, Geoff shared some of the material that culminated in his book, *Living on the Fault Line*. He returns this year to discuss what lessons he’s learned as a result of his initial engagements with *Fortune* 2000 companies. Danny Hillis,

co-founder of Applied Minds and former Vice President and Disney Fellow of the Walt Disney Company, is uniquely qualified to address “Creativity and Technology.” And nothing less than “The Transformation of Society” is the topic of choice for scientist-artist-philosopher John Seely Brown, Director of the Xerox Palo Alto Research Center.



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Editor-in-Chief of CIO Magazine Abbie Lundberg and other senior editors will again be on hand to lead the Executive Mindshare Sessions, small group discussions for participants to share experiences and find solutions on key issues.

Dust off the golf clubs and the tuxedo - you’ll need both (although not at the same time!) to take advantage of the great networking opportunities we offer. Sunday we host a golf tournament at the newly redesigned championship Riverwalk Golf Course. Tuesday’s black tie bash pays tribute to this year’s CIO 100 Award Honorees during a special reception and dinner. Meet more of your fellow participants at Café 100 gatherings

To enroll, CALL 800 355-0246, visit our WEB SITE at www.cio.com/conferences.

ALL BARK NO BITE

THAT'S THE SAD TRUTH ABOUT SECURITY AT MANY COMPANIES. The firewalls, passwords and VPNs may look formidable, but determined bad guys can often pick the locks and sneak right past the guard dogs at the gate. You know you can never be 100 percent secure, but you should take as many steps as possible to protect your digital assets. ■ Trouble is, the pieces of the security puzzle are constantly moving, multiplying and changing shape. How are you going to put them all together? You know your business model inside and out, so you're the best one to answer that question—and you can bet it's going to be more involved than simply hiding behind a firewall. ■ This special section on information security will tell you how to evaluate and mitigate your company's security risk. First, read a profile of Cardinal Health's integrated security SWAT team. Then probe the limits of security "seals of approval." Discover what a former hacker says we really need to fear. And watch how investigators conduct digital autopsies to solve computer crimes. Now, lock the door, draw the shades and read.

PHOTO BY STONE



INSIDE

Someone to Watch Over You

A security strike force protects Cardinal Health's digital and physical security. Could this work for you? **PAGE 82**

Conspiracy of Silence

No one's talking out loud about security. They should be. **PAGE 92**

12 Keys for Locking Up Tight

An ounce of prevention isn't enough. Make sure

you have all the right ingredients. **PAGE 98**

Stamps of Approval

Security certification gives you a seal that tells the world you're secure. But is it a bunch of baloney? **PAGE 104**

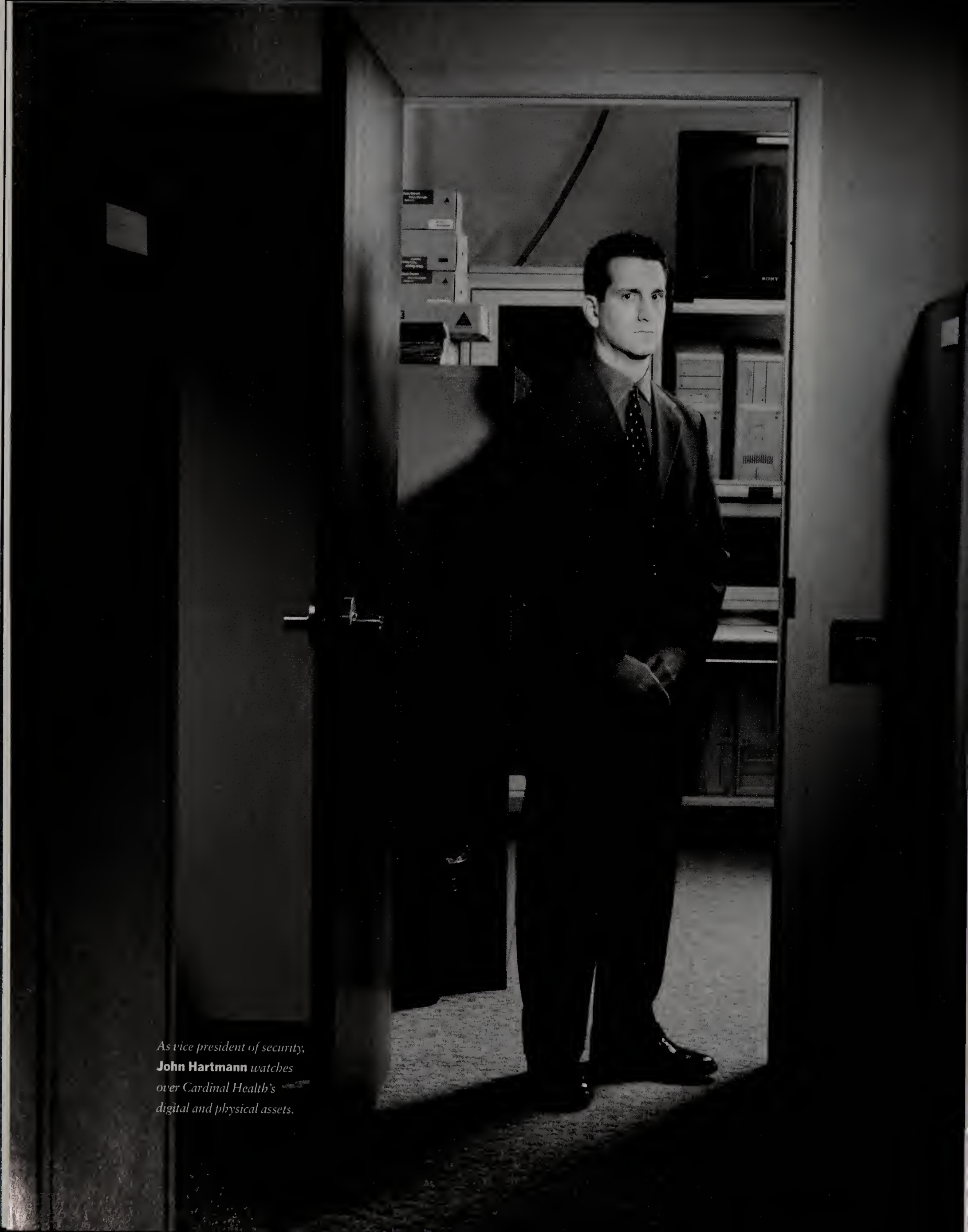
IT Autopsy

When an attack occurs, the computer forensics specialists find the smoking gun. **PAGE 114**

Mudge Ado About Security

Mudge, a former hacker

and one of the nation's foremost security experts, details the perceptions and fixations that hobble most security efforts. **PAGE 126**



*As vice president of security,
John Hartmann watches
over Cardinal Health's
digital and physical assets.*

A single sentinel in charge of security, both physical and digital, makes sense for this company. Does it make sense for yours?

SOMEONE TO WATCH OVER YOU

BY TRACY MAYOR

A SECURITY BREACH IS ABOUT TO OCCUR at your company. Think fast. Who will slam the electronic door on a hacker without erasing evidence of the digital misdeeds? Would someone in your company have the presence of mind to activate door and badge systems, pull access files and look for other signs of a physical break-in—or would those thoughts surface days or weeks later, after it became clear that the hack was an inside job? When the time came to charge the perpetrators, would you or someone who works for you feel comfortable advising your company's lawyers on whether or not to prosecute or settle the matter out of court (and out of the public eye)? ■ With its new Information Protection Team headed by former FBI supervisory special agent John Hartmann, Cardinal Health can answer "yes" to those security questions. As vice president of security for the \$30 billion, Fortune 100 health-care manufacturing and distribution company with 40,000 employees worldwide, Hartmann and his small team of security specialists oversee all aspects of asset protection—including digital data, a job many people consider as being in the purview of IS. ■ Hartmann's group of

Reader ROI

- ▶ Learn about one organization's integrated approach to security
- ▶ Hear the pros and cons of a consolidated security effort
- ▶ Determine how you might establish your company's security structure

15 acts like an internal SWAT team, helping Cardinal's business units determine the value of their data, assess the extent of its risk and decide on practical security levels on a case-by-case basis. "The philosophy was to look at security in a holistic sense," says Hartmann. "We had firewalls, and we had people with a portion of their jobs related to security, but there was no dedicated team to address the big-picture aspects of protection."

This global view of physical and digital security helps Dublin, Ohio-based Cardinal maintain a clear minimum level of security throughout the company. It also helps identify when actions in one division could compromise security. If the worst-case scenario should occur, it ensures the company is ready to respond and defend its assets in both the physical and virtual worlds.

While those goals sound sufficiently well intentioned, are you willing to give up corporate real estate or entrust the safety of your business-critical digital assets to someone in a separate security division? If your gut answer is no, you may need to sleep on this one. Security industry watchers and some analysts say an independent, elevated

security function is fast becoming a requirement for companies that need to protect their digital assets on several fronts.

At Cardinal, Hartmann receives full and enthusiastic support from Kathy Brittain White, CIO and executive vice president, and Tony Rucci, the executive vice president and chief administrative officer. The bottom line? You could well be looking at your next organizational structure.

Get Physical

When Hartmann joined Cardinal Health in October 1998, the company was in hyper-growth mode. Hartmann was brought in to keep on top of its mushrooming need for plant security, theft and tampering prevention, and the other precautions typically addressed by security officers.

Then-COO John C. Kane, who has since retired, was concerned that Cardinal was expanding so fast that it was in danger of outgrowing its security function, says Hartmann. "The original plan was to keep up with the physical security—cameras, gates and access control—and tackle the larger things that don't necessarily always get done like crisis management, risk assess-

ment and investigations into theft loss and product tampering." One of those things was protecting proprietary information, which is Hartmann's specialty. In his last position with the bureau, he investigated trade-secret thefts, hacking and other types of corporate information loss.

Hartmann spent his first six months surveying internal operations and gathering security benchmark data from contacts he had made during his tenure at the FBI. After asking individual business units in Cardinal to spell out their security procedures and concerns, he concluded the company sorely needed an information protection policy to serve as a baseline for security practices.

"The individual business units lacked a global view," says Hartmann. Some groups, typically those with sensitive data, were very competent regarding their security practices, but other groups were not. "One unit may not have assets that are as high on the risk scale as another's, but their actions on a large, decentralized network affect everyone. People don't always realize the implications their actions can have outside of a centralized IT function. All it takes is one box connected [improperly] to the Internet."

"One unit may not have assets that are as HIGH ON THE RISK SCALE AS ANOTHER'S, BUT THEIR ACTIONS ON A LARGE, decentralized network affect everyone." —John Hartmann



Hartmann called his A-list of corporate contacts from his FBI days and asked them to offer their best practices regarding security.

Hartmann's best practices contacts all worked in companies with a security team reporting to IS or on equal footing with IS. "Companies with information protection outside had increased objectivity and investigative skills, and knowledge that doesn't normally reside in IT." For example, he says, traditional security officers often have some kind of investigative training, a skill IS workers rarely possess.

Armed with those observations, his discoveries about Cardinal's business units and his previous experience in proprietary data protection, Hartmann pitched the idea that physical and information security should be combined into one functional unit of responsibility (the plan was formally adopted in the spring of 2000).

"The door was open for me to do what I had to do to show the company where I thought we should be," Hartmann says. "Cardinal is a company that creates and utilizes a vast amount of proprietary information. We do a lot of R&D, we have a lot of self-manufactured products and vast amounts of customer information, patient data and pricing information. All of that is critical to our business." Without policies, practices and review processes to address both physical and electronic vulnerabilities, he argues, the company would be hard-pressed to protect those assets.

Cardinal wins points for merging physical and digital security from Forrester Research's Senior Analyst Frank Prince, who says integrated security makes sense for many companies and is a must for those involved in e-business. IS brings its obvious expertise in network intrusions, and traditional security personnel have more experience in areas like forensics and civil and criminal lawsuits.

Cardinal has already had experience with such malicious intent. Like all security executives, Hartmann is reluctant to talk about breaches at Cardinal, but he acknowledges that two former employees were scheduled to go on trial in March 2001 for theft of



"The MESSAGE WE WANT TO SEND is that Cardinal takes INFORMATION PROTECTION AND SECURITY very seriously." -John Hartmann

trade secrets. Hartmann is slated to testify in the case and can only say that the incident was a combination of digital and physical (an electronic plus hard-copy) theft, the investigation happened under his watch, and he recommended to senior executives that the company press charges. "The message we want to send is that Cardinal takes information protection and security very seriously and will go to all means to protect that information," he says.

To Assist and Advise

Hartmann's group is charged with four primary responsibilities:

- Developing and updating security policies that are understood and agreed on by business unit leaders and effectively communicated and enforced throughout the organization
- Conducting vulnerability assessments of networks and systems, as well as filing cabinets, desk drawers and any place where security breaches might occur, whether digital or physical
- Collaborating projects
- Detecting intrusions and coordinating emergency response when a security breach occurs or a cataclysmic event hits the company

In other words, Hartmann's team talks about the need for firewalls rather than installing them. "John isn't doing password protection and firewalls. That's our job. All the security that you need for applications is our responsibility," says CIO White, who doesn't feel she is losing "real estate" to Hartmann. "He covers things like patent protection that my group would never deal with. I think of what he does as an enhancement rather than giving up ground."

White presides over a \$250 million, 1,500-person operation and has responsibility for all IT initiatives, including the company's business-critical Cardinal.com e-commerce project. The role of Hartmann's 15-person team is "to assist and advise."

Every Cardinal business group, including IS, is ultimately responsible for its own day-

to-day operational security. Hartmann's group provides global intrusion detection, easy access to security expertise, an enterprisewide view of data protection and if all else fails, a targeted response team trained to minimize damage and preserve evidence.

"I focus on what's right for my area. They're looking at the big picture for the whole company," says Mike Beck, manager of telecommunications and technical shared services, which has called on the Information Protection Team when developing the company's Internet infrastructure for Cardinal.com. "We go to them and get their opinion first, and we follow their guidelines in setting up our security features."

"John has acted as a consultant to the CIO and to me to help us figure out what the state of the art should be on informa-

tion protection," says CAO Rucci. "But it's very clear in my mind that the accountability falls with the CIO for anything and everything having to do with information security. Kathy White has full involvement and veto power over information security."

Hartmann and White have nothing but praise for each other and their collaborative environment, and each insists that in two years they have not encountered an impasse that couldn't ultimately be resolved through bargaining and negotiation. "I get asked to make judgment calls in situations where the ideal scenario is X, the practical solution is Y and the minimally acceptable solution is Z," says Rucci, who gets the occasional jump ball kicked to his office. "We have to take it on a case-by-case basis, but the big question is always, What is in the best interest of our customers and our shareholders?"

Collaborate Early and Often

In his benchmarking research, Hartmann realized that organizations with the most effective information protection strategies had created a team of experts who functioned like internal business consultants. "That's the model we adopted," he says. Although he refers to his team as a service organization and his business-unit users as clients, funding comes from the corporate budget rather than a charge-back basis.

The goals of Hartmann's team are to emphasize collaboration, get involved in projects as early as possible when security considerations can easily and inexpensively be built into applications to offer solutions, instead of simply pointing out transgressions. "The old days of in-your-face security are gone," Hartmann says. "You can't just point your finger at someone and say, 'Your system's not secure.' You've got to bring him a solution."

For instance, when White was in the planning stages for Cardinal.com, the company's procurement and reporting site for health-care corporations, a representative from Hartmann's group was involved to establish security policies, provide security guidance and conduct a security review

THE SECURITY EXECUTIVE'S TO-DO LIST

- Merge physical and IT security organizations.
- Have asset owners identify critical assets, determine their value and participate in risk assessments.
- Audit security early and often.
- Demand background checks and psychological profiling for sensitive staff.
- Evaluate business partners' security.

Source: Forrester Research



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when the project was ready to launch. However, the nuts-and-bolts details of passwords, firewalls and so on were left to e-commerce designers in individual IS groups like Beck's.

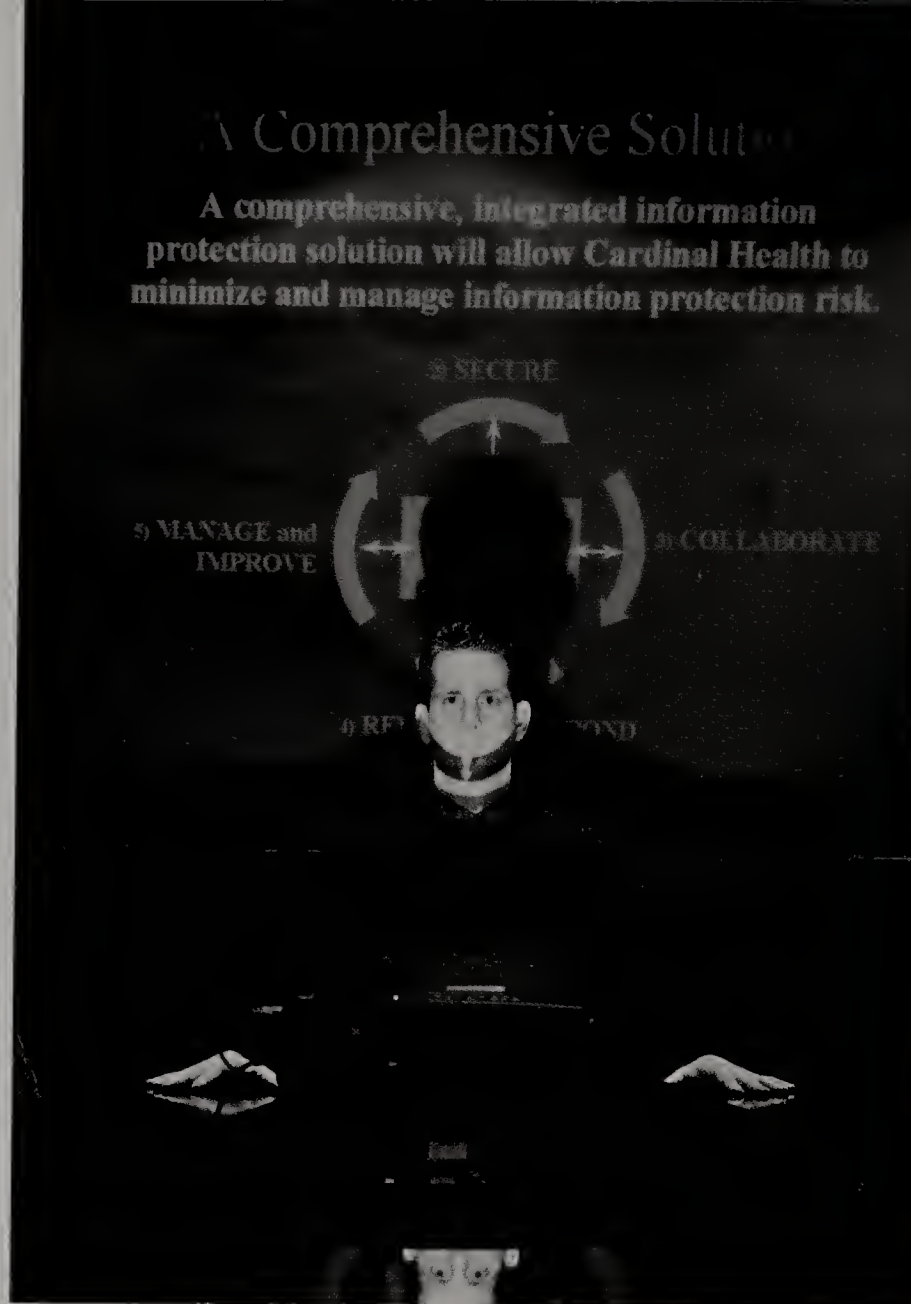
When business unit managers disagree with security advisers on the level of protection a particular project needs, business value is always the tie breaker, Hartmann says. The Information Protection Team's formal mission is to "ensure the integrity, confidentiality and availability of critical information and information assets, while maintaining the competitive agility of Cardinal Health business units." In other words, Cardinal wants to be as secure as it can be.

Hartmann is all too aware that security people, especially former FBI employees, can come off as paranoid fanatics. "We constantly balance risk versus accomplishment. The onus is on us to come up with security solutions that don't hinder business goals."

In building the Information Protection Team and developing security guidelines, Hartmann first convened an advisory committee comprising representatives from legal, risk management, internal audit, HR, IS and other key departments to establish standards and working procedures. "If you want people to feel like they own the policy, you have to pull them together and ask for their input. If you want a team response, you have to have the group offer solutions right from the beginning."

The team often tries to walk business owners through the process of understanding just how much their knowledge assets are worth to the company and just how vulnerable they may be. Once business units have a full idea of what their assets are worth, they're often more likely to agree with the team's security recommendations.

Early and frequent collaboration is the



HARTMANN IS ALL TOO AWARE that security people, especially former FBI employees, CAN COME OFF AS PARANOID FANATICS.

easiest way to smooth negotiation among the various departments, says Forrester Research's Prince. To determine who should be at the table when it comes time to build a security team, Prince suggests skipping ahead and envisioning an actual security breach at your company. Who needs to be involved? Certainly IS, but also plant security, facilities people, HR, legal, public relations and so on. "Instant-response teams have a range of organizational components, but those people should all be involved in planning and implementing security in the first place," he says.

On the Case

For all their initial success, Cardinal executives aren't sure if their current structure is the result of institutional brilliance or sim-

ply a matter of skilled personalities in the right place at the right time. Rucci and White are both enthusiastic supporters of Hartmann, but say his position is the result of his unique background and the entrepreneurial atmosphere that was in play at Cardinal at the time.

"John Hartmann had been with the FBI, and his specialization was information protection. We looked at that and said, 'Here's a person with some unique skill sets, what should we do with him?'"

White agrees with the unique nature of Cardinal's situation. "If John were not here at the time, it probably wouldn't have been done that way," she says. "My organization was so lean, his organization was brand new; it's as if we were in startup mode. In an organization with a more mature IS group, I don't know if it would make sense to pull security out like that."

Security specialists believe Cardinal's approach will make sense for more organizations in the long run. As companies realize their intellectual property exists in multiple forms, they'll eventually move toward a risk-management model of protection that addresses physical, logical, technical and business risks, predicts Christian Byrnes, vice president for security programs at Meta Group, a Stamford, Conn.-based consultancy.

Byrnes has seen a few early adopters like Cardinal in the health-care and finance sectors, but feels most companies are still five to 10 years away from having an elevated, coordinated security unit. "You can't say it's the wave of the future yet," he says. "But the far future? Yes, probably." **CIO**

Tracy Mayor is a freelance writer in South Hamilton, Mass. You can reach her at tmayor@mediaone.net.



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COLUMNS

Avoid the ostrich approach to security

Amazingly, many companies still take an apathetic approach to security because they don't believe a security disaster will ever happen to them. Columnist Olivier Thierry begs to differ. www.windows2000advantage.com/columns/01-08-01_security.asp

CASE STUDIES

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MOMENTUM >

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2000 GENERATION >

Microsoft Mobile Information 2001 Server enabling Windows 2000 mobile users to go wireless

In anticipation of high projected wireless mobile Web and e-mail access demand, Microsoft's Mobile Information 2001 Server – which was introduced as part of the .NET enterprise server line – was created with Microsoft Windows 2000 mobile users in mind. Expected to become available during the first half of this year, Mobile Information 2001 Server will offer not only e-mail access, but access to calendaring and other wireless applications such as customer relationship management (CRM) and accounting.

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Q&A >

Aberdeen Group analyst says Windows 2000 ready for reliability prime time

Tom Manter, research director at the Aberdeen Group, is finding that both dot-com and enterprise computing users are increasingly choosing Windows 2000 over Unix alternatives. Could this mean that Sun is setting?

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MOMENTUM >

Rapid Economic Justification methodology paves way for Windows 2000

To assist IT executives with the challenges of economic justification of their technology proposals, Microsoft offers its Rapid Economic Justification (REJ) framework. According to Microsoft, the purpose of REJ methodology is twofold: to help IT professionals analyze and optimize economic performance of IT investments, and to expedite resources and capital appropriation for IT projects. Thus, IT executives are able to do scenario planning, effectively trying out which investments would make the most business sense for an organization.

"About four years ago, Total Cost of Ownership (TCO) was a key decision factor for IT investments," says Shafeen Charania, Microsoft's director of Business Value Marketing. "Microsoft focused its product development and planning to address TCO, and ensure that Microsoft products provided successively lower TCO."

Then, approximately two years ago, Microsoft began to examine the other side of the technology investment coin, with a lens focused on Total Benefit, or Value of Ownership. "As we started looking at the benefits versus just the costs associated with IT, we began to understand that this is a relatively new area of research, and that most efforts to quantify the benefits of IT involved a great deal of analysis and many months of effort," says Charania. "We felt that it would be a good thing to build a framework that provided a more immediate analysis of the business impact of IT. We engaged academia, industry analysts and worked with customers and partners to develop the REJ framework."

Microsoft's REJ process provides templates for written documentation, and a presentation format for the economic analysis. In all, the REJ framework consists of five steps.

For the full story, visit: www.windows2000advantage.com/momentum/01-15-01_rej.asp

QUOTE OF THE WEEK >

"You can take Commerce Server 2000 out of the box, slap a coat of paint on its pre-built features and make it do what you need to do."

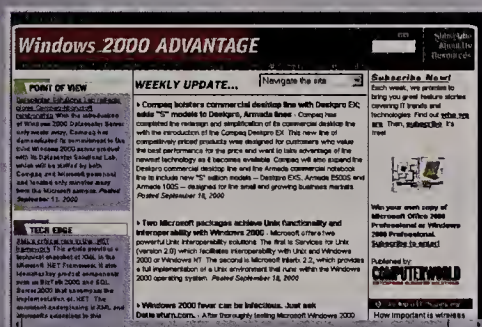
— Rob Reed
manager of Web IT
Starbucks Direct

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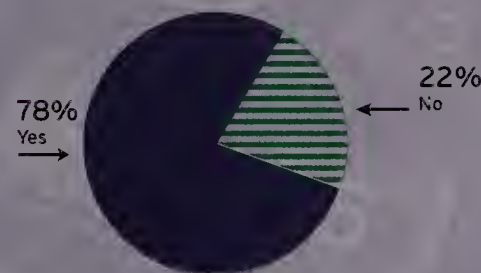
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You can't ignore them or avoid them, so you might as well face the security threats to your company's digital crown jewels

CONSPIRACY OF SILENCE

BY ANGELA GENUSA

WHEN IT COMES TO DIGITAL INFORMATION SECURITY, CIOs seem to heed the advice of the World War II propaganda posters that read, "Loose Lips Sink Ships." Although security is on every CIO's mind these days, it's certainly not on their lips. We contacted more than two dozen CIOs to speak with them about security. While many declined our requests for an interview, several spoke with us only on the condition of anonymity. As the CIO of a financial services company explained, "Neither I nor any of my peers would want to go on record as saying we're concerned about it and know we have flaws," he says. "Nor would we want to say we're not concerned about security, that we have everything in place and we are bulletproof. Either way, it would immediately set us up as a target and a challenge for hackers or attacks." ■ Security is the one critical IT issue corporate America isn't talking about for fear that anything that is said could be construed as an invitation to attack. Experts say this conspiracy of silence only aids those responsible for digital security breaches. ■ What's the best course of action?

Reader ROI

- ▶ Understand the nature of security risks to your organization
- ▶ Realize the level of security appropriate for your digital assets
- ▶ Develop an awareness of security issues facing your company

Acknowledge the problem, pay attention to security threats (both known and unknown), and if your company experiences a security breach, don't treat it like a dirty little secret. Talking about it internally and sharing information externally with other IT executives and law enforcement authorities will help everyone better understand security threats and improve prevention efforts.

The fear of attack is real and valid. Every day there are new reports of security breaches. The list of companies that publicly suffered attacks last year is a literal A to Z of networked America—Amazon.com,

These are just some of the publicly acknowledged attacks, say computer security professionals. In a recent survey by the Computer Security Institute, 90 percent of information security managers have detected breaches at their organizations. Despite this alarm, upper management—fearing bad publicity, shareholder wrath and consumer mistrust—has erected a firewall of silence around the double-headed beast of security and privacy. “Nobody wants to admit they’ve had some level of intrusion or break-in, but I can’t imagine that there’s anybody out there who hasn’t had an unauthorized

only 26 percent of CIOs and IT executives said their company had ever been hacked, according to a survey at the CIO-100 conference last August. Sixty-two percent said their company has never been victimized by external computer crime, and 11 percent were unsure. *Unsure* is the key word. “These people are being hacked; they just don’t know it,” says the CIO of a research and engineering company.

Open and Shut Case

As corporate networks keep expanding, CIOs face a catch-22 situation. Opening their infrastructures to customers, suppliers, business partners and employees is a must. Yet doing so makes their companies more vulnerable to security breaches or attack. “On the one hand, we’re getting pulled to make it easier and easier [for everyone] to access key data from anywhere in the world,” says the CIO of a Fortune 1000 manufacturing company. “On the other hand, we’re worried about security. We’re building a paradox here. How do you do all that?”

CIOs’ jobs have been made even more difficult as most corporations trampled past security issues in the mad rush to mine e-commerce gold. In the CIO-100 survey, a mere 9 percent of the respondents reported security as the number-one technology-related issue on which their company was currently focused. More than half of businesses worldwide spend 5 percent or less of their IT budget securing their networks, according to a recent study by Datamonitor. More than 30 percent have yet to even implement adequate security.

Most of the CIOs we spoke to believe the security breaches they’ve experienced thus far—“fortunately,” they say with relief—are nuisances rather than dire threats to their companies. However, even mere security nuisances can do real damage to the bottom line.

Take the “I Love You” virus. This and similar viruses brought down systems worldwide and caused \$6.7 billion in damages in the first five days, according to Computer Economics. Denial-of-service attacks that temporarily took down high-



“Nobody **WANTS TO ADMIT they’ve had some level of intrusion or break-in.”**

—An executive vice president of IT at a financial services corporation

America Online, AT&T, BellSouth, Bloomberg, the CIA, De Beers, E-Trade Securities, the FBI, Lucent Technologies, Microsoft, Qualcomm, The Republican National Committee, Slashdot, Sony Corp. of America, the University of Washington Medical Center, Verizon, Western Union and Yahoo.

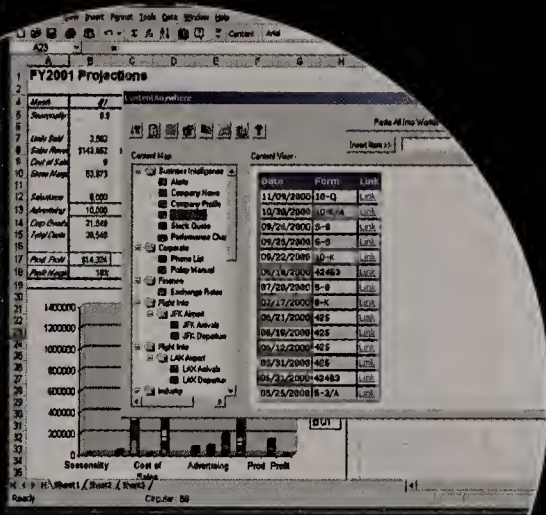
access or attempt,” says the executive vice president of IT at a financial services corporation. Only a handful of the companies that have had breached security or compromised data ever report it to law enforcement officials, say the FBI and security consultants.

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profile websites like Amazon.com, eBay and Yahoo in February 2000 cost \$1.2 billion, according to The Yankee Group. More than 74 percent of companies have experienced financial losses because of cybercrime, according to the Computer Security Institute report. The price tag on e-security breaches alone? More than \$17 billion worth of damage worldwide in 2000.

Software giant Microsoft was reportedly hacked for months before it discovered the breach. The costs to a company's credibility and losses in consumer confidence are difficult to calculate but can be enormous.

What's worse, experts and government officials warn that these incidents are "canary in a coal mine" signs that portend a huge security disaster. At the Microsoft SafeNet 2000: Policy and Practice in the Internet Age summit in Redmond, Wash., experts tossed around talk of "the big one"—a digital Pearl Harbor, a World Trade Center e-mail bomb or an Exxon Valdez data spill. The CIO of a Fortune 500 manufacturing company believes these apocalyptic predictions may come to pass. "I hate to say it, but I think they're right," he says. "Somebody's going to break in somewhere and do something dramatic, and then people will wake up."

Security Through Obscurity

Many CIOs espouse a similar, it-always-happens-to-the-other-guy kind of thinking when it comes to security disasters. "We're off the radar screen," says the Fortune 500 manufacturing company CIO. "Who cares what we do—except maybe for a competitor or someone who has a grudge against us?"

In today's networked economy, security experts warn, CIOs can no longer afford to think that way. "The concept of 'security through obscurity,' that 'There are so many companies out there, why would I be a target?' was once almost plausible," says John S. Tritak, director of the U.S. government's Critical Infrastructure Assurance Office in Washington, D.C. "If your company depends on a brand, any customer interaction, back-office business functions or networking



"Somebody's going TO BREAK IN somewhere and do something dramatic, and then PEOPLE WILL WAKE UP."

—CIO of Fortune 500 manufacturing company

dependencies, a minimal level of security is a must in today's economy."

Security experts urge CIOs to tear down the firewall of silence that surrounds security. Corporate America needs to go public about its security secrets, they say, and share information to learn from others' mistakes and create consistent protocols.

"We need to publicize attacks," writes Bruce Schneier in *Secrets & Lies: Digital Security in a Networked World* (Wiley, John & Sons, 2000). "We need to publicly understand why systems fail. We need to

share information about security breaches: causes, vulnerabilities, effects, methodologies. Secrecy only aids the attackers."

Whatever you do, don't ignore the issue, says the CIO of a Fortune 500 financial services company who has survived at least one nasty security incident. He says, "It's here, and if you ignore it, you'll get burned." **CIO**

Senior Writer Angela Genusa promises to keep your secrets. Tell her about your company's security or insecurity at agenusa@cio.com.



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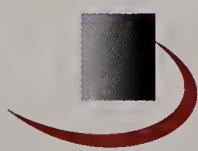
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12 KEYS FOR LOCKING UP TIGHT

BY ANGELA GENUSA



IN A PERFECT WORLD, A BIT OF COMMON SENSE and a dash of due diligence would protect us from hackers, saboteurs and the common cold. Well, the world isn't perfect, and we know we can never be completely secure. There is a measure of safety to be gained by following a formula of threat education, security breach prevention and risk mitigation. ■ "There's no single answer," says Bruce Schneier, CTO of security consultancy Counterpane Internet Security in San Jose, Calif., and the author of *Secrets & Lies: Digital Security in a Networked World* (Wiley, John & Sons, 2000). "I can't say, 'Do these seven steps and you'll be magically secure.'" Although every organization's security infrastructure must be unique to be effective, Schneier and other experts point to the following essential ingredients. Pay close attention to these basic security issues.

1 ESTABLISH ACCOUNTABILITY Companies have traditionally relegated security to IS, viewing it merely as an administrative function and expense. However, security can no longer be a closeted IT function, says Michael Assante, cofounder and chief intelligence officer of LogiKeep, a security consultancy based in

Dublin, Ohio. "It's got to be a boardroom issue and not a backroom issue. It needs to become part of a business decision-making process, looking at system survival and business continuation issues. Accountability should fall on the shoulders of the business decision makers."

As the liaisons between operations and

management personnel, CIOs are uniquely positioned to champion IT security issues in their organizations, according to John S. Tritak, director of the Critical Infrastructure Assurance Office with the U.S. government. CIOs and other senior IT executives need to cultivate and maintain close relationships with senior operations, telecommunications, physical security, human resources and other executives in their organizations to develop and implement a comprehensive IT security plan.

CIOs must have the authority and the autonomy to immediately address security issues or react to breaches quickly, says the executive vice president of IT at a Fortune 500 financial services corporation. "You can't create a ton of bureaucracy that makes it impossible for you to act or quickly react," he says. "It's called accountability."

Some companies are hiring vice presidents of security and chief information security officers (see "Someone to Watch Over You," Page 82) to put policy, processes and methodology in place. Some are hiring chief privacy officers (see "Oh No, Not Another O!" CIO, Jan. 15, 2001) to oversee privacy issues. However, these positions must be more than window dressing, security experts say.

2 PROMOTE AWARENESS A lack of awareness of the potential threats from the CEO down is a major barrier to implementing security. "It's difficult to move a security initiative forward because most people internally see it as a bureaucratic administrative kind of thing," says the CIO of a Fortune 1000 manufacturing company. "It doesn't matter how many times you wave policies in front of them; it has a half-life

of about five minutes in their minds."

CIOs need to raise internal awareness of security among senior management and all employees through ongoing security awareness programs and wide distribution of policies and procedures. "It's incumbent upon the CIO to keep this in people's faces," says the executive vice president of IT at a Fortune 500 financial services corporation.



3 PROTECT YOUR ASSETS What are your company's crown jewels and where do these critical assets reside? They may be private customer records, sales information, employee files or transaction records, proprietary pricing, formulas or recipes, and knowledge. "I've been told by CIOs that very often, there is not enough appreciation for the crown jewels of the company," Tritak says. "As a result there is a tendency in some institutions to seek some sort of uniform level of security across the entire organization, which may not be adequate for the real security of high-end critical assets. You may be oversecuring some assets and undersecuring others."

What are the IT assets that enable you to deliver products and services for your company? As companies increasingly depend on technology to deliver and store their crown jewels, the potential for theft or damage

increases. Assigning a value to these mission-critical IT assets helps senior managers understand the value of IT to their success.

4 MAINTAIN VIGILANCE Security is a never-ending process. "People tend to think of security as something you do once in a while and then you can forget about it," Tritak says. "Well, we did it for Y2K; we're done.' It would be like asking, 'When can I stop doing marketing?' Well, when do you want to go out of business?"

CIOs should conduct regular, ongoing audits of their company's security infrastructures using an independent source, Tritak says. CIOs audited their networks in preparation for Y2K, assessed their risk and took action; they treated Y2K as a business issue. Now CIOs need to go beyond the lessons learned from Y2K and consider the consequences of business disruption from security breaches. "In the information age, you're dealing in a very dynamic environment; the risks and vulnerabilities are changing constantly," Tritak says.

Gaining the CEO's and board members' buy-in is also part of an ongoing security plan. "It's buying in to a new way of assuring and securing your business," Tritak says. "It's part of a mind-set that is beginning to evolve to thrive and manage risk in an information age." The goal is to create a trusted, reliable business environment. Failure to do so can have serious repercussions and destroy relationships with customers and investors.



SECURITY DEFINED

For a comprehensive list of security terms and technologies, see "Define Your Terms," exclusively on our website, www.cio.com, as well as the rest of our security coverage and our new security research center.



5 SPEND CAREFULLY Security decisions are often made in haste after news of a recent virus or attack. Some corporations react to the latest security threat by throwing a lot of money at protecting their systems from that specific threat. Forrester Research predicts select American companies will spend \$19 billion on solving security problems by 2004. One of the myths the industry propagates is that more security is better, Schneier says. "More isn't obviously better," he says. "If I were a bank, I could strip-search every customer that walks into the bank. That improves security, but my business will fall apart."

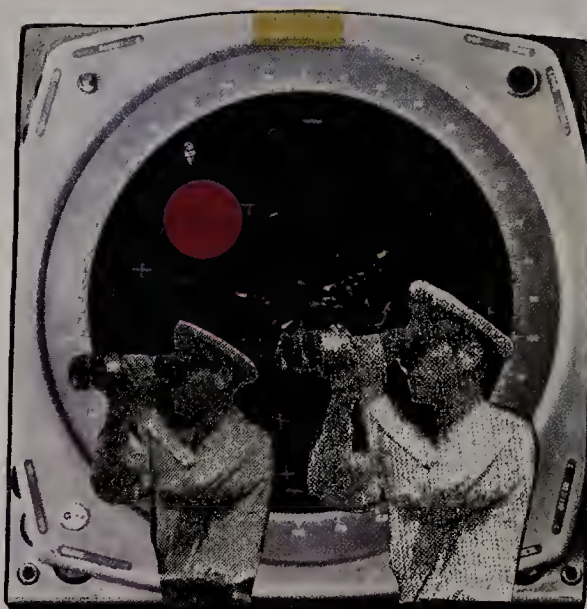
Rather than throwing dollars at the problem, CIOs should carefully incorporate security considerations in the acquisition, development and installation of new IT systems as a standard practice, according to security experts. Most security software packages and hardware configurations on the market are one-size-fits-all solutions designed to work in any organization. These products leave open many avenues of attack and threat, and, in the end, cost more.

CIOs who are stuck with legacy systems and putting security Band-Aids on patched-together networks face a game of catch-up, Schneier says. "You're doing the worst job, and it's more expensive."

6 SURVEY THE THREATSCAPE To adequately secure their companies, CIOs need to understand and monitor all the dangers—both internal and external—to

their companies. Security threats to their businesses may include social, economic and geopolitical factors. Identifying those threats or "the enemy" is becoming more and more difficult as borders and boundaries dissolve around nations, organizational structures and individuals.

Geopolitical incidents pose new security risks with dire threats to U.S. corporations, Assante says. "The Internet gives people the ability to take action and do it in the anonymity of the Internet," he says. "Instead of saying, 'You've got to have firewalls,' CIOs need to focus on the threat-scape." To determine your company's risk profile, enlist the help of the COO, CFO, corporate legal counsel, auditors, bond raters and insurance companies.



7 MITIGATE RISK CIOs must know what risk their businesses are willing to bear. Take the risk of shoplifting, for example. In the brick-and-mortar world, companies have long understood this "acceptable" risk as the cost of doing business and mitigated it with security measures. Grocery stores post sensors at exits and use surveillance cameras and store guards. Jewelry stores keep gems under lock and key, and employees carefully watch as customers handle merchandise. Apparel stores put garment tags on clothing and sensors on the doors.

Security in the networked world is no different, Schneier says. "It's all about understanding what the risks are and accepting those risks, mitigating them technologically,

procedurally or contractually.

Schneier illustrates acceptable risk with a U-shaped curve. "On the far right are very expensive security and no or low losses to attack," he says. "On the left at the other top of the U are very expensive losses and no security. In the middle is some sweet spot: just enough security and just enough losses. Where that sweet spot is will be different for every company, depending on their risk profile."

8 EMBRACE RISK CIOs should approach security as risk management, rather than threat avoidance. Some risk is good, say security experts. "The higher the risk, the higher the profits," says Mudge, vice president of research and development at @Stake in Cambridge, Mass.

Good risk management depends on a company's business model, its risks and the value of the transactions at risk, Schneier says. "If you think of the credit card industry, the threats are enormous," he says. "They still haven't solved the problem. But if I go to the credit card companies [to sell them security], they tell me, 'We're making a fortune. Shut up.' That's the right way to think."

To win the dollars you need for security, conduct a threat analysis based on your company's business model, Mudge says. Then build a business case for senior management, presenting security as a revenue generator, not an expense. An incentive approach, as opposed to a liability approach, gives you a





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much better chance of getting an adequate security budget.

"If I say, 'I need a million dollars to minimize the chances we will potentially lose a million dollars,' it will be tough to acquire that budget," Mudge says. "It's a lot easier to get that money if I say, 'I need \$1 million to enable us to drive more revenue. With our existing architecture, we can do only 1,000 transactions per day, but with this new architecture we could do 5,000.'" Pitched as an opportunity and strategic advantage rather than a potential loss, security becomes a fortuitous byproduct, he says.

9 MIRROR THE BUSINESS If you look at your company's operating system and network, and you can't tell what it's designed for, your company is accepting undue risk, Mudge says. "The standard security profile is not the same at any given time and at any given company," he says. "Your business model should define your security stance, and your security must mirror your business."

Security is a state of mind engineered and designed into the infrastructure, rather than vice versa. A well-designed architecture eschews superfluous services and unnecessary risk, Mudge says. "Fort Knox was designed with big walls for good reason—they knew what they were going to be storing there. They knew what their business was."

It's also much more efficient if you design security into your infrastructure from the beginning, Schneier says. "If you just finished building a bank and then you figured out you need a vault, an alarm system and cages for the tellers, suddenly you're redoing everything."

10 GO BEYOND TECHNOLOGY IT executives have typically mitigated security risks with one-size-fits-all hardware and software, believing these tools would make their companies secure. There is no such thing as being "100 percent secure," say security experts. "You never go into a store and say, 'Sell me a lock that prevents all burglaries' or 'Sell me a

firewall that will prevent all hackers.'" Schneier says. "Buying a lock for your door is part of a very complex system of prevention, detection, alarm and response, police force, deterrence—all of those things combined. If you've never been burglarized, it's because of that [combination], not because of some magic piece of technology. The Net is the same way."

As in the real world, if someone really wants to break in, they'll find a way to do it. Firewalls, digital watermarks and biometrics are no match for a determined hacker.

Derek Harp, chief executive officer of LogiKeep, agrees. "Technology solutions are not the solution," he says. "People are exploiting vulnerabilities and creating tools to escape detection. Time and time again, technology has fallen short."

Relying solely on technology to solve security woes is a recipe for disaster, say security experts. "CIOs have been sold a bill of goods by security companies [that say,] 'Here's our



magic security dust: Buy a firewall, buy a PKI [public-key infrastructure], buy a security detection system, buy this,'" Schneier says. "They've been screwed a lot of times."

11 DETECT AND RESPOND Detection response is much more effective than prevention. "You have to be watching 24/7/365," Schneier says. "You can't put a sign on the server that says, 'Please restrict all hacking from Monday through Friday between 8 and 5.' If you

don't have someone watching it 24/7/365, you're going to get whacked."

Schneier recommends that CIOs outsource security detection and response. "It's the main reason no one has their own fire department," he says. "You never know when a fire is going to break out. If you did your own [detection and response], it would be a few months of boredom and then a few minutes of panic. It makes no sense for you as a business to have your own fire department."

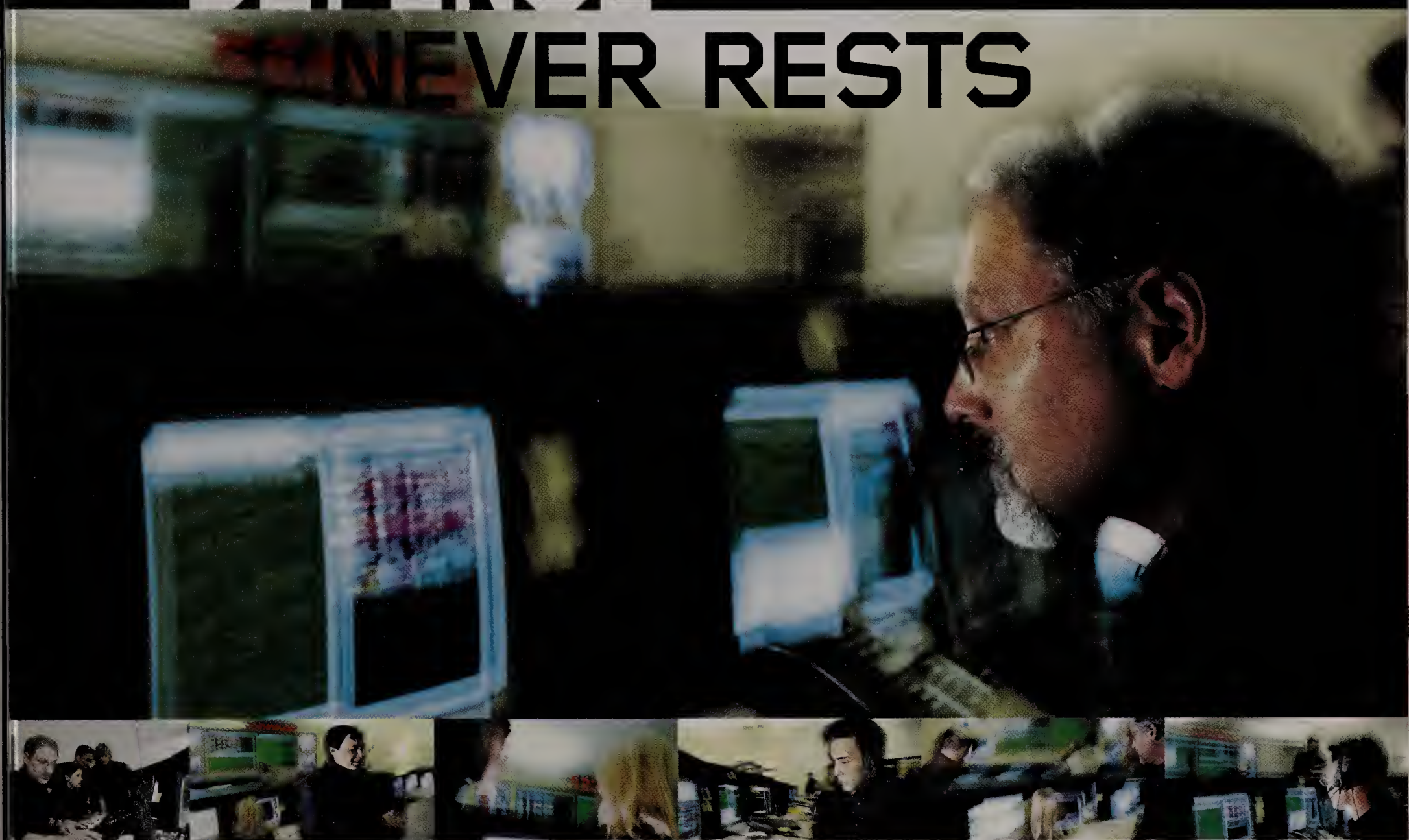
12 EDUCATE OTHERS Most often, people are the weakest link in the security chain. Security is inherently a people problem because people *are* the network. CIOs need to educate employees about security risks and threats, from e-mail viruses to protecting proprietary information, Tritak says.

Employees who would never consider leaving their house key under the doormat don't think twice about posting their network passwords under their mouse pads. For hackers skilled in "social engineering," coaxing network passwords from most employees is disarmingly simple. Most employees are also unaware of simple security risks, such as sending proprietary information by e-mail.

The CIO of the Fortune 1000 manufacturing company tells of an executive who wanted to work on a document containing proprietary information over the weekend and e-mailed the document to himself at home. "This document went out over the Internet," the CIO says. "Who knows what route it traveled over the world, what servers it hit or who saw it. This person never thought once about that and didn't realize that it wouldn't be totally secure. People don't think about it. They're thinking about doing their job, working at home, and the easiest way to get it there is to e-mail it to yourself at home. It's like 'Wake up!'" **CIO**

Any other aspects of security keeping you awake at night? Tell Senior Writer Angela Genusa via e-mail at agenusa@cio.com.

THE DEFENSE FRAME NEVER RESTS

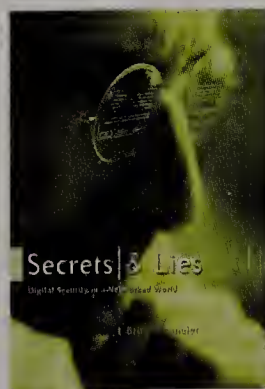


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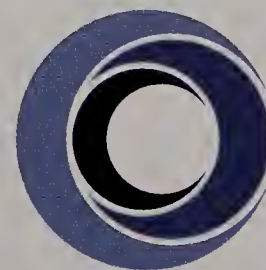
Managing network security is a full-time job. Firewalls are a good start, but it takes more than just hardware and software to get the job done. Real security means spotting attacks and responding to them the instant they occur. That's what it takes to make sure an attack doesn't compromise your business, shut your network down, and send your stock plummeting.

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*PartMiner CTO **Mark Schenecker**
feels that increased customer trust
translates into increased transactions.*

Getting a third party to vouch for your security is good for your company's image. How much you can trust it is another matter.

STAMPS OF APPROVAL

BY ERIC BERKMAN

SECURITY IS THE BIGGEST CONCERN for anyone engaged in e-business, no doubt about it. However, it's no longer a matter of whether companies have security—if they don't, they won't be in business long—but just how effective that security is. ■ This concern for security quality has spawned a rapidly growing industry for third-party certification. Hundreds of companies—including brick-and-mortar types such as the Miller Brewing Co., financial services companies like Mellon Shareholder Services, and even ASPs such as Digital Insights—are bringing in accounting organizations and security vendors to audit their security posture. The goal is to win a “Good Housekeeping” type of security seal that tells a company's partners they can have confidence doing e-business with it. But is this reassurance more valuable as a marketing tool or is it a true benchmark of a company's security stance? ■ Companies that have been through the certification process say it works. Take the case of New York City-based PartMiner, and its e-marketplace, the Free Trade Zone, that went live last year. Before it did, CTO Mark Schenecker assembled a focus group to determine how folks on both sides of the electronics components

Reader ROI

- ▶ See why more companies are seeking security seals of approval
- ▶ Understand what value you can and can't place on them
- ▶ Learn how to cover all of your security bases



supply chain felt about security. He got an earful. "Your website promises that you won't share our data," the group's participants told him. "We trust you personally, but how do we know you're really taking all the right steps to keep our information out of the wrong hands?"

So Schenecker brought in the Big Five accounting firm Ernst & Young to evaluate PartMiner's security practices. After combing through the company's firewalls, intrusion-detection technology, hosting center, physical plant, internal procedures and other systems, Ernst & Young bestowed its seal of approval on PartMiner, which the company displays prominently on its website. PartMiner pays Ernst & Young five figures each quarter for it to continue that testing and monitoring.

Schenecker insists his company has gotten value for its money. "Our market is a very tight community," he says. "The level of trust has increased, and we believe this has translated directly into the level of transactions performed on the site."

Who Tests the Testers?

The security community is split as to the real value of certification. Sure, it works well as part of an advertis-

ing campaign, but what does certification really prove?

Security certification vendors like TruSecure in Reston, Va., and Axent Technologies in Cupertino, Calif., insist that people can trust any company that is awarded their seals, because it means they've passed rigorous testing against all threats. But that's exactly the problem. A seal suggests absolute security, but nothing is 100 percent secure. While there may be complete protection against known threats, enterprising hackers are constantly coming up with new methods of attack.

Meanwhile, there are no universally recognized standards for testing an organization's security. Nor is there any universally accepted body that will approve or oversee those who do the testing. No one is even in the process of formulating specific testing standards. So, unless you're an expert yourself, it's tough to ferret out the fly-by-night opportunists looking to make a buck. And if you are an expert, why would you need any of these guys in the first place?

That being said, it would be a mistake to label certification a waste of time and money. After all, if you're investing the resources, you are at least demonstrating that you have security on your radar screen and that you are taking it seriously.

TESTING, TESTING

Here are organizations that provide security certification seals and services:

Formerly known as ICSA (International Computer Security Labs), TruSecure (www.trusecure.com) puts network architecture, connectivity, physical security, disaster recovery and operational policies through rigorous tests before offering certification. It has certified more than 400 companies for an average annual price of \$90,000 per site.

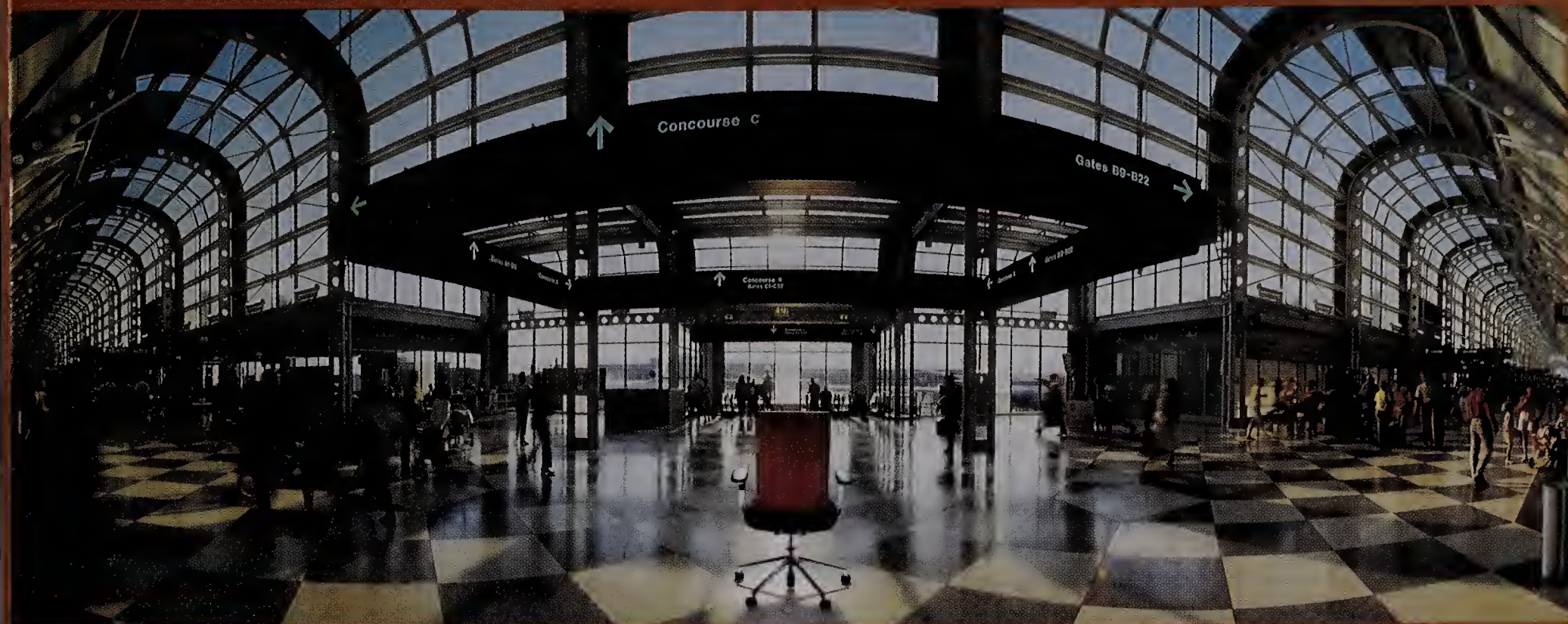
International accounting and consulting firm Ernst & Young (www.ey.com) provides a variety of privacy and security services that involve a range of techniques, from ensuring that privacy policies are posted on your website to a technical profile of your security architecture and procedures. Periodic examinations follow certification, and Ernst & Young can remove the "WebTrust Seal" until any required corrections are made. Bell-

Canada sports the Ernst & Young seal.

The Better Business Bureau's online subsidiary, BBBOnline (www.bbbonline.org) offers "privacy seals" to websites. It doesn't offer security seals per se, but the certification process for privacy seals encompasses certain security requirements, like ensuring personal information is secure from unauthorized access. The cost ranges from \$200 a year plus a \$75 application fee for companies doing less than \$1 million in business per year to \$6,000 a year plus the fee for companies doing more than \$2 billion. The BBB has certified more than 700 websites, including American Airlines, AT&T, Dell, Dunn & Bradstreet and The New York Times.



TRUST-e (www.truste.com) also offers privacy seals, but businesses must demonstrate reasonable data security measures to become certified. It has certified approximately 2,000 websites, including major Internet portals like Yahoo and Excite. Costs are on a sliding scale from \$299 to \$6,999 depending on annual revenue.



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"We know our [certification] has been successful based on the amount of inquiry from potential business partners and new customers about the nature of certification," says Mike Lapelosa, director of internal audits for Group Health Inc. (GHI), a New York City-based health-care network. "And we see a lot of organizations beginning to use the same process."

A typical certification is much like a physical exam. Just as a good doctor will do more than simply ask you to open up and say "aah," the good security examiner performs every conceivable test. Lapelosa went through this when he and his colleagues hired TruSecure to test GHI's information security two years ago. At the time, the health-care network was just beginning to assert its Internet presence and needed to maximize doctor and hospital access while guaranteeing the patients' right to privacy. TruSecure, a security solutions company formerly known as ISCA.net, began with an onsite evaluation of every aspect of GHI's security practices. Consultants reviewed

all written policies and procedures, interviewed programmers and computer staff to ascertain their level of technical expertise, and studied GHI's Web infrastructure to spot areas where hackers might break in undetected.

TruSecure also conducted a vulnerability analysis in which it actually tried to break in to the network from the outside and examined GHI's backup and disaster-recovery procedures in case the network went down. TruSecure eventually gave GHI its seal of approval, which the company now sports on its website. Lapelosa says the process took "two weeks from soup to nuts," with TruSecure workers onsite working full time with both him and GHI's IT staff.

The company continues to scan GHI's network for vulnerabilities on a quarterly basis, and once a year it comes in to do a follow-up of all its reviews. If GHI fails to implement its recommendations, it can lose its seal. That's something TruSecure has not yet done with any of its clients, though a

"CERTIFICATION lets you tell your senior management and board of directors that you're practicing GOOD SECURITY HYGIENE."

—Terry Milholland, CIO and CTO of EDS



spokesman said that at least once a month someone will fall into a "danger zone" where they are given up to 30 days to fix a security hole before the seal is revoked.

Lapelosa wouldn't reveal how much money was spent in GHI's certification, but TruSecure CEO Adam Joseph says the process typically costs around \$90,000 per site. "It obviously varies with the size of the company," he says.

Lapelosa says the process has given his company the assurance that it has the proper approach to security, which—with the privacy regulations of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) looming on the horizon—has become even more important for players in the health-care industry. The seal also gives people confidence in the GHI brand, he adds.

Meanwhile, experts agree that for a CIO, certification can be a useful way to cover your behind. "It validates what you say you've done," says Charlie Johnson, vice president of business development and sales at Symantec Security Services, the consulting arm of Axent Technologies. "If the company is spending the money for security services and equipment, you want someone to come in and say the money you've spent made sense and provided the level of security you thought you had."

Terry Milholland, CIO and CTO of EDS, the Texas-based computer services giant, agrees. "[Certification] lets you tell your senior management and board of directors that you're practicing good security hygiene," he says. "Of course," he adds, "that isn't to say you don't have exposures, because

PHOTO BY PHIL HOLLENBECK

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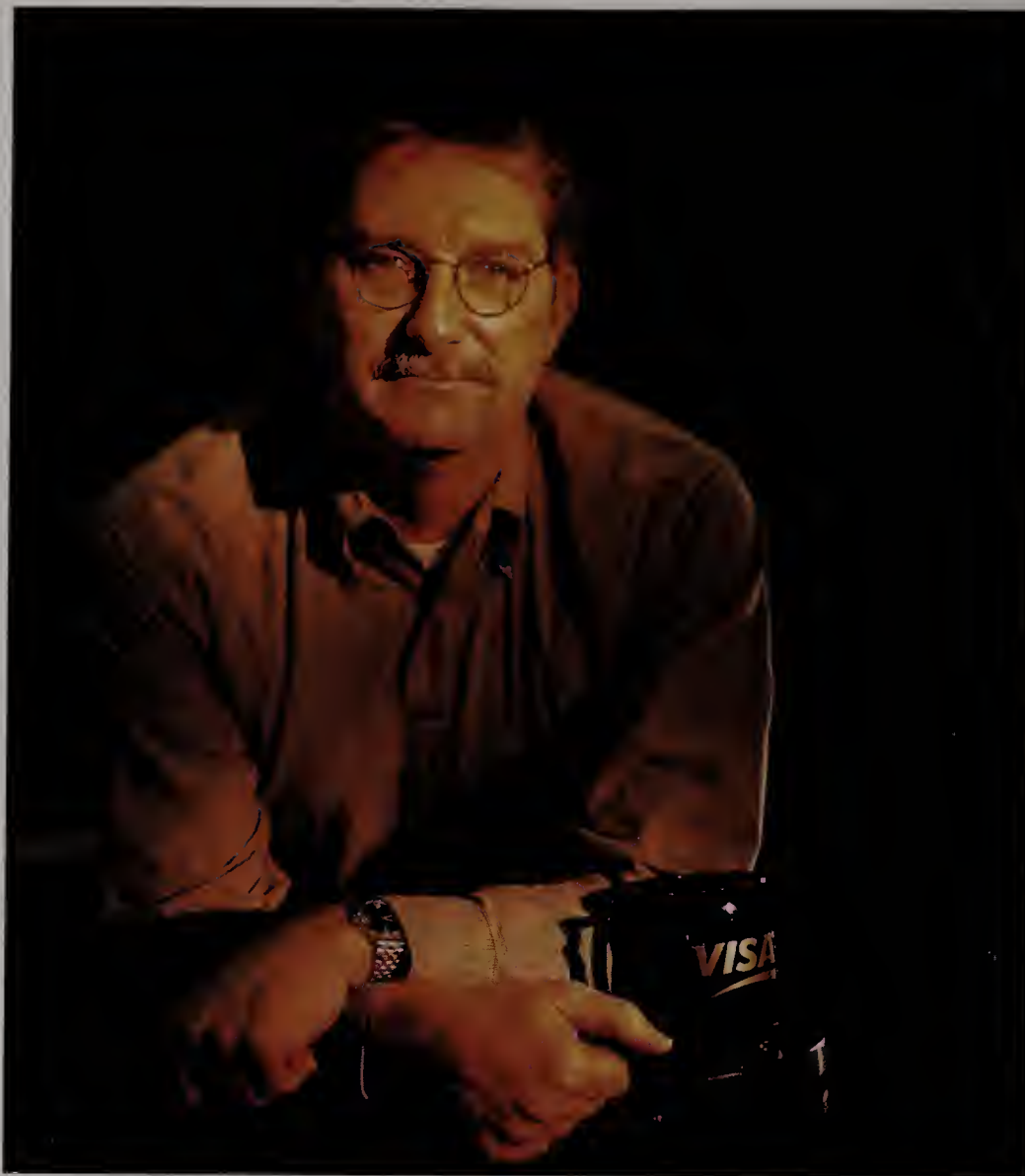
Digital Security Consultants

anyone who says otherwise is a fool.”

An additional benefit is relative peace of mind. If your vendor or Big Five company conducts ongoing monitoring, you'll know that your security practices are relatively up-to-date. Like Milholland, Johnson points out that nobody can guarantee 100 percent security. You still have to maintain whatever security would be expected of a company in your shoes. “[The certification process] gives you a warm fuzzy feeling that you’ve done everything a reasonable person would expect you to do,” he says.

Finally, you shouldn't underestimate the significance of a company's willingness to stake its reputation on its assessment of your security, says John Alsop, president and CEO of Borderware Technologies, a Toronto-based firewall vendor. “That's the real value,” he says.

As happy as certified companies may be, certification has obvious limitations. Critics like John Thomas would say that the seal in and of itself does nothing more than influence naive customers and business partners. “Those of us who know the business realize that there are no absolutes when it comes to security,” says Thomas, president of Vienna, Va.-based Titan



“With the Internet, THERE’S ALL SORTS OF NEW WAYS to obtain customer information. IT’S ALMOST LIKE ELECTRONIC DUMPSTER DIVING.”

—John Shaughnessy, Visa USA's senior vice president of risk management

Vigil, a company that performs security monitoring for commercial and government organizations. “If someone came to me and said, ‘Please do business with me because I’ve got X, Y and Z’s approval,’ I’d chuckle to myself before laying right into them.”

Just When You Think You’re Secure...

The very act of stamping a seal on your website can be risky. It's a lot like the old Eveready commercials, where actor Robert Conrad would put an alkaline battery on his shoulder and dare you to knock it off. The minute you start bragging about how secure you are, hackers will line up to try to prove you wrong. In fact, many in the hacker community actually believe they're doing a public service by exposing insecurities, says Thomas.

“They’re very cynical people,” he says. “As soon as someone comes along and says, ‘Do business with me because I’m secure,’ I can promise you some hacker will get in and plant some kind of logic bomb.”

Meanwhile, how can you be so sure the tests proved anything in the first place? While there may be recognized standards for testing the security of a product, there's no commonly accepted methodology for testing the security of an organization. Standards are important for any kind of security testing, says Ron Ross, director of the National Information Assurance Partnership in Gaithersburg, Md., a government group that validates lab testing of IT products.

“I’m not saying a seal has no value, but if everyone is doing something different, it’s hard to compare what kind of service you’re really getting,” he says.

Plus, not every evaluator will necessarily be on the up-and-up. There are plenty of reputable vendors out there, but there are also a lot of guys who see that this is a hot area and hang up a shingle, hoping to get some action.

“You especially see this in areas where security is becoming federally mandated, [like banking and health care],” says Rob

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- Encrypt stored data that's accessible from the Internet
- Encrypt data sent across networks
- Use and regularly update antivirus software
- Assign unique identifications to each person with computer access to data
- Don't use vendor-supplied defaults for passwords and security
- Track access to data, including "read only," by unique ID
- Regularly test security systems and processes
- Restrict access to data by business "need to know"
- Maintain a management policy that addresses information security
- Restrict physical access to cardholder information to authorized employees

Source: Visa USA

Dodson, director of business development at Symantec Security Services central region. "People with no medical background are all of a sudden becoming HIPAA experts. And people with no incidence-response background are jumping all over the FDIC incidence-response requirements."

Perhaps the biggest concern of all is the fact that when you're certified, it reflects a mere snapshot in time. Basically, it tells people that according to a particular testing methodology, you were secure as of 10:24 a.m. last Tuesday—the last time you were monitored. The problem is, that doesn't guarantee that you were secure at 10:25 a.m.

That's a major reason why Thomas takes these seals with many grains of salt. "A lot of people think it's like the UL [Underwriters Laboratory] stamps they see on their TVs," he says. "But their TVs don't change a lot from when they bought them."

Johnson takes the timing metaphor a step further. It's like checking a guy before he walks into a bar to see if he's been drinking, he says. "Four hours later, he's blind drunk, but he stumbles into a cop and hands him a piece of paper saying he's fine."

Red Flags and Best Practices

If you do decide to have your security certified, there are steps you can take to maximize the value of the process. First, choose the right vendor. Like anything else, it's a combination of name recognition, references, reputation and experience. You want someone you can trust, because you're giving that company the

most intimate access possible. Schenecker felt most comfortable with Ernst & Young. Lapelosa went with TruSecure, because he wanted a company that dedicates 100 percent of its business to security assessments.

Johnson recommends having two companies certify you. That's one way of dealing with the lack of standards, and it also gives you an extra layer of confidence, he says. "It's important. Because if you're not secure, you'll be on the front of *The Wall Street Journal* explaining why your stock shouldn't drop down to \$10."

When it comes to doing business with a company that already boasts a seal on its site, don't take that as the only thing you need to know. Meet with the people handling its security and ask intelligent questions. Better yet, have your own third-party expert look into its processes and technology.

"Look at how it was assessed," says Thomas. "Look at things like ongoing monitoring. Check to see if the security officer is principal to the CIO or four echelons below."

If the CIO has sole responsibility for security, with no input from the CFO or in-house auditor, that's a big red flag, says Thomas. "I love CIOs," he says. "I was the CIO of many organizations when I was in the military. But I know the stresses CIOs come up against. And if the CFO isn't engaged in the information security business of the company, I'd question whether there aren't some holes in the sieve."

Make sure your partner adheres to the same standards you do. For example, credit card behemoth Visa USA has come out with a list of requirements that member banks, merchants and third-party service providers will eventually have to satisfy (see "Visa USA's Security Requirements," at left). These requirements already apply to ISPs and gateways, and Visa insists on the right to have its chosen security experts conduct onsite reviews and Web server monitoring.

"With the Internet, there's all sorts of new ways to obtain customer information," says John Shaughnessy, Visa USA's senior vice president of risk management. "It's no longer the old dumpster-diving type thing. It's almost like electronic dumpster-diving, and we need to make sure we're up to speed as an industry."

What it comes down to is that, where security is concerned, there's no such thing as complete trust. Thomas is an advocate of any process that improves security, for example, but believes that putting faith solely in seals is a mug's game.

"I'd encourage anyone to go through the process of having his security reviewed," he says. "But don't think for a minute that the endgame is to have the process performed and then you walk away." **CIO**

Tell Senior Writer Eric Berkman whether you've certified your security at eberkman@cio.com.



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No longer an obscure component of network security, computer forensics has blossomed into a science all its own

I.T. AUTOPSY

BY MATT VILLANO

THE CALL CAME IN EARLY ON A WINTER MORNING LAST YEAR. An urgent voice spoke about corporate espionage and theft of trade secrets. After a few deep breaths, the caller identified himself as counsel representing an international bank and said he was highly distressed about a developing situation with one of the bank's former employees. He outlined allegations that before joining another company, the employee took internal client information valued in the million-dollar range. The official said he was turning to investigators from New Technologies Inc. (NTI) for help. ■ Paul French, manager of NTI's Computer Forensics Laboratory, opened an investigation right away. With cooperation from the bank and the suspect's new employer, French got the employee's old and new computers and made copies of the hard drives on each one. Working off these copies so as not to damage the originals, French then used proprietary tools to search for hidden information about certain files. In a matter of hours, NTI investigators confirmed that the employee had taken key documents from the bank, downloaded them on to a floppy disk, and saved them on his computer at his new job. ■ "All in a

Reader ROI

- Understand the science of computer forensics
- See how forensics can uncover evidence of crimes
- Learn to use forensics to your advantage

day's work," French deadpans, in the best Sgt. Friday impression he can muster. "This [employee] thought that by tossing files in the trash, he could erase all the evidence of his crime. Suffice it to say, he thought wrong."

Bad guys always overlook something, and this ill-fated criminal underestimated the effectiveness of computer forensics. Like more traditional police forensics, this science has one overarching goal: to find evidence of crime and preserve it for eventual use in a court of law. Once regarded by technophiles as an obscure component of network security, the discipline has blossomed into a science all its own, garnering widespread attention from analysts and CIOs and sparking an industry of companies such as NTI. This boom makes perfect sense—as enterprises become more complex and move more information online, they leave themselves increasingly vulnerable to high-tech crimes of every ilk. Securing evidence necessary to convict an attacker becomes a matter of paramount importance.

Still, because the industry is fairly new and response efforts can cost millions, it is primarily CIOs at large, well-endowed companies who have had the opportunity to tackle the science in-house. Those looking for cheaper solutions have outsourced computer forensics on a case-by-case basis, calling a third party for help after an attack. Both strategies work, so long as evidence of a crime is obtained through the proper methodology. And computer forensics is perhaps the best way to track down who did what, and how he pulled it off, according to Thomas Talleur, managing director of the forensic technology services group at KPMG. "Corporate criminals don't always tell the truth," he says. "Their computers, however, usually do."

Forensics 101

While the industry has taken off only in the last few years, the science began back when computers were used mostly for word processing and spreadsheets. In those days, if corporate officials suspected employees of foul play, they'd dispatch secretaries to snoop around hard disks after hours. When these



**"Corporate criminals DON'T ALWAYS tell the truth.
Their computers, however, usually do."**

—Thomas Talleur, managing director of forensic technology services, KPMG

secretarial spies uncovered something fishy, officials instructed them to use the digital document as a guide while they rifled through file cabinets, desk drawers and the trash. The thinking here was practical—because few businesspeople eschewed the printed page until the rise of the Internet, it was a safe bet that any document stored electronically had a matching hard copy somewhere nearby.

Gradually, as computers entered the mainstream and computer crimes became more complex, forensic methods changed. Today,

with recent statistics from the Meta Group indicating that the vast majority of all documents are stored digitally, the science hinges almost entirely on computers themselves. Computer forensic specialists call on a mix of investigative wit and high-tech know-how to reconstruct the particulars of a hack, theft of trade secrets or pornography scandal conducted on company machines. To extract a deleted memo, for instance, they can scan thousands of hidden backup folders for certain key words. To establish someone's

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whereabouts on a particular day, they might peek at a series of pages in the Web cache or in an area called file slack—the microscopic space between individual files—for time-stamped text documents.

“Forensic investigators of the modern age can resurrect e-mail messages from a computer that hasn’t worked in years, or establish a time line of crime from the hard drives on 15 separate laptops,” says Talleur. “We sure have come a long way from sending the secretary to rifle through the trash.”

Despite this evolution, a key aspect of the science, called chain of custody, hasn’t changed at all. Chain of custody is the record of who had possession of the evidence and what they did with it. The chain, which can

be established with documents or testimony, enables lawyers to show the court that computer records submitted as evidence are in the same condition they were in at the pertinent time, and that they have not been tampered with or altered so as to become inaccurate records of the event, according to Linda Stevens, general partner in the litigation and intellectual property groups at law firm Schiff, Hardin & Waite in Chicago. While this provision is intended to protect the defendant from evidence tampering, the requirements can hurt the plaintiff if the evidence is mishandled. A perfect example: Last spring, after a hacker broke through the firewall at Wallingford, Conn.-based CD Universe and stole 300,000 credit card numbers, authori-

ties declined to prosecute a teenage suspect because they claimed specialists responding to the situation had tainted the evidence. Details are still sketchy, but experts familiar with the case allege that employees from one or more of the computer security companies that handled the break-in inadvertently altered access times on log files from the day of the attack. Joan Feldman, founder and president of Seattle-based Computer Forensics, followed the case closely; she says this kind of mistake would have made it impossible to authenticate any evidence whatsoever.

“On a PC running Windows or NT, when you go into Explorer and click on a file, you automatically change the last access date, right?” Feldman says. “If you do that to the only copy of a file that’s critical to a case of computer crime, you’ve just ruined your evidence.”

SAY WHAT?

SO YOU’RE NEW TO THE WORLD OF COMPUTER FORENSICS? To make you feel more comfortable, here are some of the most common words and phrases in the industry.

Ambient data: Data stored in nontraditional computer areas and formats, such as in the Windows swap file, unallocated space or file slack.

Clusters: Fixed-length blocks of data (one to 128 sectors) in which DOS and Windows-based computers store files.

File slack: The data storage space that exists from the end of a file to the end of the last cluster assigned to the file.

Mirror-image backup: This copy of a hard drive, or other storage device, exactly replicates every sector of the original. It is accepted as a substitute for the original in a court of law.

Sectors: The smallest unit of storage on a computer. Sectors are composed of bits, and are generally a power of 2 bytes in size. A “regular” disk sector is 512 bytes.

Steganography: Encrypting and hiding data, for example in graphics, by changing the least significant bits into the message bits.

Unallocated file space: The area on a computer’s hard disk where content goes when files are deleted or removed. The only way to clean this space is with cleansing devices known as scrubbers.

Windows swap file: A file that Windows-based computers use as a “scratch pad” in which to write data when additional random access memory is needed.

For a more comprehensive list of security terms and technologies, see “Define Your Terms” on our website at CIO.com, along with the rest of our special focus on security.

Process Makes Perfect

What happens when a company suspects a security breach and turns to forensics for help? First, as with any other crime scene, it’s crucial that no one disturb the evidence. Even without a body or bullet casings, a computer can contain just as much evidence as the site of a homicide, says Julie Lucas, director of information security at Houston-based network consultancy GlobalNetwork Technology Services (GNTS).

To ensure that evidence is processed safely and to eliminate discrepancies in the industry, investigators follow a standard four-step regimen. First, they isolate the system, making sure no perpetrators, outside or in, can further damage or alter the crime scene. Next, they secure and copy the evidence for analysis. One way to do this is to mount an external tape-drive and take an exact binary image of the computer’s hard disk. This digital duplicate becomes the version investigators use to explore the evidence without ruining it, and its importance is yet another reason why IT staffers should avoid tinkering when something dire occurs.

Many investigators take the original hard drive and lock it in an onsite storage facility such as a closet or safe. With this evidence

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secure, investigators finally can do what they do best—investigate. Using a bevy of forensic tools made by niche companies, investigators search hidden folders and unallocated disk space for copies of files a user thinks he's deleted. The tools allow searches by keyword, file type or access date.

These procedures usually take a few days to complete; evaluating the data they produce takes much longer. Once experts have conducted an investigation, it can take weeks for them to make sense of everything they've found. Verification is the final step in the forensic process and usually ends with the preparation of a findings report that can be used in a court of law. Documentation is key here. Sean McCreight, CEO and chairman of Pasadena, Calif.-based Guidance Software, says investigators must be able to explain the methods they employ to uncover every byte of data. Because evaluation strategies differ, McCreight notes that this is the part of the forensic process that sets one investigator apart from another. Do it right, he says, and you're golden; do it poorly, and you could find yourself on the wrong side of a devastating legal loss.

"Data without the proper validation and documentation is just pure data," he says. "It's one thing to have volumes of information in front of you. It's another thing to be able to dig in there, give everything some context and put it together in a way that everyone in a courtroom can understand."

Do-It-Yourselfers

Companies that develop forensic capabilities in-house use money from the general IT security budget to develop divisions devoted to chasing down evidence after crimes. At Boeing, Motorola and others, for example, CIOs have hired squadrons of network security specialists to double as forensic investigators. Because these companies have so many security concerns, it's actually cheaper for them to build forensics teams from scratch than to farm out services on a per-case basis.

Microsoft, for instance, has hired Howard Schmidt, former director of computer crime



"When we're not TRACKING DOWN evidence of WRONGDOING, we're proactively searching for it."

—Howard Schmidt, chief security officer, Microsoft

and information warfare at the Air Force Office of Special Investigations, as chief security officer and has groomed a team of 10 investigators to gather digital evidence. Late last year, EDS Corp. launched a Global Information Assurance program structured around a spanking new CyberForensics Lab at the company's Herndon, Va., office.

Companies can also use forensic techniques to engineer some preemptive security checks. At EDS, for instance, forensic specialists occasionally monitor employee hard drives to make sure nobody's stealing company secrets.

At Microsoft, Schmidt says his job hinges on much of the same. "With all of the top-secret stuff we have going on here, we need to make sure that none of our employees are taking classified information and sending it elsewhere," he says. "When we're not tracking down evidence of wrongdoing, we're proactively searching for it, scanning hard disks in the name of corporate security."

These projects can get expensive. While they declined to reveal actual figures, Schmidt says Microsoft spends "millions and millions" on forensics every year, and

Daryl Eckard, director of operations for EDS's Global Information Services Group division, says his company threw a "significant" amount behind the new lab. But financing is only the beginning, and even with the necessary funds, establishing an in-house computer forensics program on the corporate level can be tough. First is the issue of education. Investigators who have not received formal law enforcement training must endure rigorous knowledge transfer classes to learn the craft. Second is the issue of policy. McCreight and Schmidt suggest that before IT leaders even think about forensics, they should sit down with representatives from the legal and human resources departments to discuss procedural requirements and other expectations.

Chris King, program director of the global networking strategies team at the Meta Group, warns, too, that CIOs should be aware of how network security decisions might affect an employee's perception of privacy. Because plans such as Microsoft's hinge on regularly imaging a company's hard drives, employees often speak out against them, publicly invoking passages

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from the 1986 Electronic Communications Privacy Act and privately comparing employers to Big Brother. While concerns like these are legitimate, KPMG's Talleur suggests that employees should be told that forensics is a matter of self-defense, and if they don't like it, they can work somewhere else.

"Being able to retrieve digital evidence is more about catching employees stealing company secrets than it is about nabbing them abusing the Internet," he says. "If an employee is spending the day looking at

[pornography], you can bet we'll take note. In the scheme of things, though, that stuff is harmless compared with the crimes we're really out to find."

A Little Help from Their Friends

Because not all companies have the resources to handle forensics endeavors on their own, their CIOs have turned to vendors and consultants who specialize in forensics solutions of every kind. Experts say this setup benefits everyone involved—vendors earn more charging for services by the

hour than by selling a product, and clients achieve peace of mind knowing that their evidence is being processed by true pros. Some forensics, says King, is better than nothing at all.

Perhaps the best known of these forensics companies is NTI, where French and his colleagues foiled the former bank employee earlier this year. From its modest headquarters in Gresham, Ore., a staff of 20, including 10 computer forensics specialists, supports 25 proprietary products. On a recent winter morning, investigators (they call themselves "geeks") huddled around one of their own as he evaluated evidence for a \$6 billion class-action lawsuit involving more than 20 laptops at a Fortune 100 company. Using a product called FileList, they strung together access dates in hidden files on each machine. "Of course we think our products are the best, but we don't care if we use our products or the next guy's," says Mike Anderson, the company's founder and CEO. "We'll do whatever we can to establish evidence that our clients can use in a court of law."

Others subscribe to the same philosophy. In Alexandria, Va., Riptech supplements an outsourced 24/7 information security monitoring and management offering with a computer emergency response team that performs general analyses and remediation efforts onsite. Provo, Utah-based AccessData recently released a Forensic Tool Kit to complement a previously limited consulting business that specializes in troubleshooting encryption crises of any kind. Then there's WetStone Technologies, a company that offers products and services for helping companies address steganography, the process by which nefarious employees encrypt and embed data within ordinary e-mail attachments (see "Say What?" Page 118).

Not every company offers both proprietary products and advice on how to use them. Guidance Software sticks to software, devoting most of its efforts to developing its flagship product, EnCase, which it markets as a full-service forensic tool. GNTS does the reverse, eschewing sales for what the company considers to be a more practical focus

TOOLS OF THE TRADE

WITH THE AMOUNT OF MISSION-CRITICAL INFORMATION stored digitally increasing every day, there's never been a better time to purchase tools to help track down computer crime in your organization. Which do industry experts rate most highly? Here's an incomplete list.

EnCase. This full-service product from Guidance Software offers a Windows-based environment from which users can copy and investigate data on their own. What's more, the application's evaluation capabilities ostensibly obviate the need for a trained investigator. Consistently ranked among the best forensic programs on the market, EnCase recently matured to Version 2. www.encase.com

Forensic Tool Kit. Though it does not image hard disks with a built-in tool, this new product from AccessData provides applications to investigate original evidence, enabling users to search with a number of strings at once. It works well with encryption programs and is designed to draw on them to weed through hard-to-reach places on a network or hard disk. www.accessdata.com

Net Threat Analyzer. Net Threat Analyzer is like a dog that can sniff out Internet access. Put out by New Technologies Inc., this DOS-based tool searches Web caches and file slack for ghost files that indicate where a user has been. Users can search data for particular words or frequently used addresses. This product is only available to and used by law enforcement agencies. www.forensics-intl.com

SilentRunner. A new product from Raytheon, SilentRunner spots suspicious clusters of activity on a company network and alerts systems administrators immediately. Part artificial intelligence, part pattern recognition, this program is more of an intrusion detection application than it is a forensic one. Still, users can print out results for further examination if necessary. www.raytheon.com

SmartWatch. Watching a host computer like a hawk, this product from Wetstone Technologies detects even the smallest changes to computer files, then reports them immediately. The program can be configured to image a disk repeatedly during an attack or can be programmed to recover key resources from a secure backup to automatically reinstate files. www.wetstonetech.com

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on incident response and information assurance assessment. This second model appears to be popular; of the two dozen or so companies in the forensics space, more than half take a similar approach. At CFI, for instance, investigators help corporate attorneys understand the nuances of the evidence they find. And at Foundstone, based in Irvine, Calif., specialists tackle fraud and other computer crimes unique to the financial services industry.

"People can buy products anywhere, even online," says Kevin Mandia, Foundstone's director of computer forensics. "Talented, reliable and experienced people who understand a niche—now that's hard to find."

Looking Ahead

Mandia is right, but changes in the forensics landscape may soon make it easier for CIOs to spend a couple bucks and secure evidence on their own. A number of software companies such as AccessData and WetStone are developing applications that automate forensic responses, ostensibly eliminating the need for investigators. These programs promise to manage everything from copying hard disks to evaluating evidence. What's more, because most of them are slated to cost less than \$1,000 per license, industry watchers such as Meta Group's King say that just about anyone with security concerns can purchase them and implement them painlessly.

**With a NEW WAVE OF TOOLS and techniques
for computer criminals to crack
into CORPORATE NETWORKS, government
experts expect 2001 to bring more
COMPUTER CRIME than ever before.**

While these new products could represent the democratization of computer forensics, vendors and forensics consulting companies see automation as a direct threat to their businesses. "Why would you pay to have a person secure evidence when you can have a program do it in a fraction of the time?" asks Larry Kanter, partner in charge of the computer forensics practice of PricewaterhouseCoopers. "With changes in the industry, with software that handles many of these forensic applications, I'd guess that a number of CIOs at smaller companies will handle this themselves."

NTI's Anderson disagrees, saying that so long as human beings sit on juries, there will be a need for some degree of subjective interpretation from real live people.

Whatever happens, many forensic experts are getting ready to fight other fights. The first is political, and dozens of investigators are lining up to help U.S. government officials review the recent recommendations of the Committee of Experts on Crime in Cyber-Space, an international

coalition, for a treaty espousing increased computer surveillance for law enforcement officials around the world. The second skirmish is perhaps more immediate: With a new wave of tools and techniques for computer criminals to crack into corporate networks, government experts expect 2001 to bring more computer crime than ever before and are working furiously to develop ways to stop it.

For some CIOs, this will require increased commitments to raising awareness of the need for computer forensics, both inside their organizations and out. For others, it has inspired a return to basic forensic practices and a desire to enroll in classes to brush up on their forensic skills. Schmidt, Microsoft's CSO, says these trends are only the beginning of major changes in the industry. And as more computer crime cases make their way to the courts, lawyers continue to establish precedents on which to build future arguments, preserving the future for a science that can only grow in scope.

"Sure there are threats, but on the whole, I'd say that as this industry hunkers down for the next big wave of crime, it's also ready for more technologists to embrace forensics on the whole" says Schmidt. "The more people in IT understand about forensics, the more CIOs will jump aboard and start employing it. Will crime increase? Perhaps. But if you're a bad guy, look out, because the chances of getting caught are about to increase tenfold." **CIO**

FORENSICS ON THE WEB

To learn more about computer forensics, visit these websites.

- www.usdoj.gov/criminal/cybercrime
- www.treas.gov/usss/index.htm?electronic_evidence.htm&1
- www.epic.org
- conventions.coe.int/treaty/en/projects/cybercrime.htm

For more on computer forensics, see "Building a Legacy" and "Take a Bite Out of Crime," as well as the rest of our security coverage on our website at CIO.com. Also check out our new security research center.

Matt Villano, a freelance writer based in New York City, has discovered more than 2 million files hidden on his hard disk. To find out what they contain, e-mail him at mjv@whalehead.com.

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BY MUDGE

TAKE THE DIME, ONE THIN DIME. What is it? Most people will see it as part of the monetary system. That is, you use it to buy things. It can also be a screwdriver, a very slender shim or a decision-making tool (heads or tails?). Seeing it only as one-tenth of a dollar is an example of functional fixation: the inability to see a use for something other than its intended use. ■ Now take digital security, everything from firewalls to virus software and the like. Corporate America sees these solutions as a magic elixir, suitable for any environment. This is another unfortunate example of functional fixation. ■ This fixation is a problem because off-the-rack digital security is of limited value. Technically, an auditor could ask whether a corporation had a firewall and consider his work complete. Would that same auditor be doing his job if he had asked a bank if it had a vault and left it there? Hardly—he'd ask more questions: Is the vault locked? Who has the keys? What's stored in it? When and why is it opened? Substitute "digital security" for "bank vault" and you're starting to understand the need for security customization. ■ A bank cannot claim to be diligently protecting its customers simply because it possesses a

safe. Similarly, the notion that installing a commercially available firewall will instantly protect your company from the vagabonds of the Internet is ludicrous. How can a business address its unique security needs through third-party vendors that don't know its business? A library, an automotive manufacturer, a financial institution and a telecommunications business each have unique security requirements. If an automotive manufacturer adopted the same security posture as a financial



Once you've correctly identified
the CROWN JEWELS, you can
analyze how to BEST ACCESS,
TRACK AND PROTECT them.

institution, it may be assuming an inappropriate degree of risk, which could mean either too much or too little. For example, a list of automotive dealers would not be as sensitive as a list of savings account customers, and therefore not at the same degree of risk and not worth the security investment.

Unfortunately, many CEOs and CIOs believe they have established adequate security measures by simply deploying a

firewall. When asked if they have a firewall, they joyfully respond, "Yes!" The critical follow-up question—"Is your firewall configured to map your business model in risk mitigation?"—is seldom asked.

All Risks Are Not Created Equal

It makes good business sense to accept a modicum of risk, as long as the potential rewards outweigh the overall risks. If you choose to take larger risks, they should generate a higher potential yield. So how do you go about assessing, prioritizing and minimizing risk?

Understanding your business is the first step. From this understanding, you can determine what information is truly valuable. For a car maker, it might be the designs and specifications for next year's line of vehicles; for a financial institution, it might be customer account and transaction data; and for a telecommunications company, it might be rate plan comparisons. Once you've correctly identified these crown jewels, you can analyze how to best access, track and protect them.

The next step is to measure the impact of various risks to your business. If you identify risk, but cannot determine and prioritize the potential impacts, it will be difficult to establish an effective and efficient plan to mitigate those risks.

There are numerous tools available to help evaluate business risk. In fact, the same mechanisms used for weighing business strategies often translate quite effectively to measuring digital security. I use a customized variant of a strategy analysis developed by Princeton, N.J.-based consultancy Kepner-Tregoe to evaluate R&D efforts at @Stake, the security services company where I work. This helps me weigh futures and functionalities of certain technologies and better determine threat analysis areas that need my team's attention. We can then proactively help define our client corporations' technology and security curves.

Protecting Frobnitz

Here's a look at how we might evaluate a technology for security risk prior to deployment. We'll look at a hypothetical infrastructure device called Frobnitz. Let's say Frobnitz is deployed across a corporation to prioritize data transmissions on local networks based on whether or not the data originated from a company executive. First, we must ask why Frobnitz is being deployed in the first place. What are the business goals? How does it fit into the corporations' business model? Security becomes more manageable when placed in the proper context.

The security solutions will be quite different if we consider two hypothetical conditions. The first situation has the device used internally by senior executives to improve network performance. In this case, the overall benefit is minimal, so neither the risk posture nor the expenditure to secure the device

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should be disproportionate. A minimum need for security translates into nominal investment.

In the second scenario, the executives are performing business critical tasks like board meetings and strategic planning sessions between headquarters and remote locations over the Internet and including executives from other companies. Corporate secrets would be compromised if a competitor broke into these communications. These examples show that even a small, but disperse user base offers an entry point into the corporation's infrastructure.

Now, the analysis might continue with questions like:

- How is Frobnitz managed across the network?
- Where is it deployed on the network?
- What information can an attacker receive by watching this device?
- What information can an attacker gain by analyzing network traffic?
- What happens if the device is compromised or tricked?
- How was the component designed?
- How is it initially configured (how does it know who is an executive and who isn't)?
- What is the most restrictive configuration that will still meet the business need?

The next step in analyzing risk is to create attack scenarios around each of these questions. We continue brainstorming risk mitigation techniques and responses to threat questions rel-

ative to the amount of risk they present to the company, as well as the likelihood of an actual Frobnitz-related security breach. Armed with those conclusions, we can research a customized security posture.

Ring in the Risk

Another useful risk evaluation tool is a variation of a ring analysis. This starts with a particular "atomic point," or item, and works outward in rings of accessibility. Let's use *CIO* as an example. The core of *CIO*'s business could be viewed as its subscriber list; the valuable, targeted group *CIO* presents to its advertisers. If a competitor acquired this list, it could scoop up *CIO*'s readers, offering them various enticements. The competitor could then present itself to advertisers as the best means to reach those valued readers. The subscriber list is therefore a crown jewel worthy of securing.

During a security analysis, you would want to define the people at *CIO* who need access to the list in order to modify it, adding or subtracting subscribers. You would also define read-only access for certain employees, the areas from which employees can access this list, and other interdependencies. All of these factors would have degrees of risk and value attached to them.

Then we examine the core ring. How is the system running the source database secured? The next ring of accessibility might be the local network. Analysis of this ring should include determining how users are authenticated and held accountable. Will

a Web developer, HR manager and salesperson all know how to treat the data in a secure and consistent fashion? This may call for degrees of data classification. At this point, it should become obvious how to configure the firewall, network and host systems. This ring analysis method of risk assessment and mitigation is most effective once you understand how the components fit into the corporate model.

The idea of using the same procedures to define business risk analysis and your company's digital security infrastructure is long overdue. Whether you use a ring, financial or actuarial analysis to determine the appropriate security posture, there will undoubtedly be an increased understanding throughout the company when the results are in. Then, you will be able to truly maximize your returns against necessary risks. **CIO**

Mudge is vice president of research and development at Cambridge, Mass.-based @Stake. Reach him at mudge@atstake.com.

THE MILLION-DOLLAR QUESTIONS

Try this simple exercise to help lead your company toward the goal of maximizing value and minimizing risk.

What you'll need:

- a configured computer system about to be deployed on the corporate network
- a tech-savvy systems administrator

STEP 1. Have the systems administrator examine the system.

STEP 2. Ask the administrator if she can tell exactly what this system is set up to do and which network leg it is going to or coming from.

STEP 3. Ask the administrator about the system's functionality.

What can it do? Can it read mail? Is it a desktop system? Can it surf the Web? What is it restricted from doing? Is it equipped with the default operating system or has it been modified for a particular purpose?

If the administrator is unable to provide a clear answer for Step 2 or 3—this system may be anything from a desktop system for someone checking his bank account to the corporate database server or mail relay—then you are accepting unnecessary risk. The system has to be configured to mirror the business model. Furthermore, you will not be realizing all possible rewards, you'll be throwing away performance and introducing a tendency toward chaos during future growth.

—Mudge



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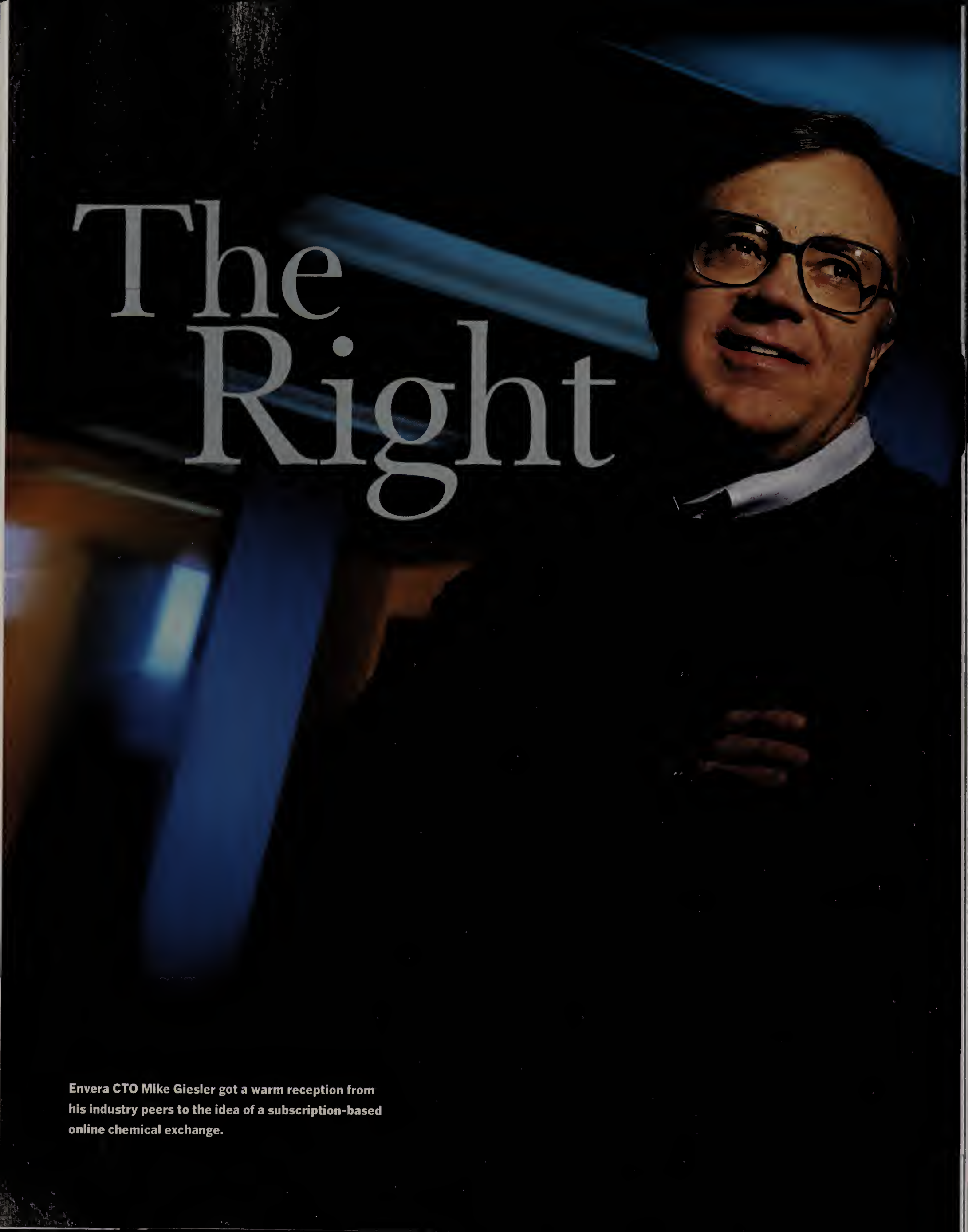
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The Right

A man with dark hair and glasses, wearing a dark suit and a light-colored shirt, is smiling and looking upwards and to the right. He is standing in a modern office environment with blue lighting and architectural lines. The background is dark and out of focus, with some blue light sources visible.

Envera CTO Mike Giesler got a warm reception from his industry peers to the idea of a subscription-based online chemical exchange.

Envera aims to provide an electronic link between chemical companies and their customers. Sounds simple, but why should the XML-based platform succeed where EDI failed?

Chemistry

BY LAUREN GIBBONS PAUL

A dirty little secret exists in industry today: In this age of e-business, most business is not electronic at all. Most businesspeople still buy and sell goods via methods that have been around for decades. They write a contract and shake hands. They pick up the phone and send a fax. The truly enlightened might communicate via e-mail.

This is particularly true in the \$507 billion North American chemical industry, where most companies have long-standing, contractual relationships with their suppliers. That's why the founders of Envera, a Richmond, Va.-based startup, think their idea of providing an electronic hub through which chemical companies can forge links with each other will strike a chord in the industry.

Reader ROI

- Discover the advantages of connecting to partners in your industry via a third-party platform
- Understand the major obstacles facing electronic exchanges

E-Commerce Strategies

Consider a typical transaction: After a bidding process, chemical companies generally enter into annual contracts to buy a certain quantity of chemicals at a certain price from a certain partner. A purchasing agent from the buyer then calls the seller's toll-free number to confirm price and quantity and schedule the shipment of an order. The seller's representative keys the order into his company's system—perhaps making an error or two—and then faxes back the order acknowledgment. The method works, but it is hugely expensive. All told, it costs between \$50 and \$100 to process a single order.

Clearly, the way chemical companies conduct transactions is in need of an overhaul. The question remains whether a marketplace such as Envera—using XML as the linchpin—can provide the answer.

Looking for an Easier Way

Chemical companies have long searched for a way to automate the procurement of production goods. Twenty years ago, many pinned their hopes on electronic data interchange (EDI), which had been used successfully in the automotive industry, but that effort failed to catch on in the chemical industry for lack of standards. Along came the Internet. At the end of the '90s, companies such as Ethyl began to build Web-based connections to many of their best customers. Using these private, company-to-company connections, the partners could obtain order information, submit orders, and find information on product descriptions and shipping details. The problem was, each connection took months and hundreds of thousands of dollars to build. There was no way companies could afford to create a one-to-one connection for each of their suppliers. Bob Mooney, then chief financial officer at Ethyl in Richmond, Va., an \$843.7 million maker of petroleum additives, remembers thinking that a better way to go would be to create a central plat-



Envera President Bob Mooney became convinced there was a better way to link chemical companies with their suppliers.

form—an electronic clearinghouse or hub—that would link chemical companies' back-end systems with those of all their suppliers. The hub would translate business documents such as a purchase order from a company's ERP system into standard XML data and send it to the partner, where it would be translated into the format preferred by the partner's ERP system. Having a centralized electronic hub would eliminate the need for companies to forge individual connections to every trading partner, in theory saving loads of time and money.

Last March, Mooney, Mike Giesler, then Ethyl's CIO, and two other cofounders began knocking on colleagues' doors, talk-

ing about creating an electronic hub for the chemical industry they called Envera (roughly translated from Latin, envera means "in truth"). Envera would differ from other electronic trading exchanges that were then making headlines, such as the chemical industry's CheMatch.com and the auto industry's Covisint, in that it would not attempt to match sellers with buyers. Rather, it would serve only as an electronic platform on which already-established business partners could conduct their transactions. Envera would not take a piece of each transaction that it hosted but instead would charge members an annual subscription fee of between \$5,000 and \$300,000, depend-

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ing on company size. Mooney and Giesler got a warm reception from their peers, snagging funding from 11 companies. Things moved quickly after that. Giesler and Mooney left Ethyl in July and by the end of the summer Envera had hammered out XML document definitions for eight basic business processes in conjunction with an industry standards group. By the fall, the initial phase of Envera was up and running, with partners such as Lubrizol and Occidental Chemical beginning to conduct business online. To date, only a tiny number of transactions have taken place on Envera. Giesler expects business to jump once Envera's 40 trading partners come online this spring.

Mooney, now president of Envera, likes to say Envera is "business for business" as opposed to the ubiquitous "business-to-business." The theory is that companies of all sizes can come together on Envera without fear that the e-hub benefits only the largest companies. "The early exchanges were dominated by the big players. A lot of smaller companies were afraid [the large companies] would get together and try to drive down prices. Our philosophy is that this is a neutral site for all the other businesses, and the

benefits get passed down to all members," says Giesler, now Envera's chief technology officer. Envera's second phase, which launched in January, added links to service providers, among them two trucking companies and one rail company to move products traded on its exchange. By banding together, Envera members will be able to negotiate discounted prices on services, according to Giesler. Envera also plans to add services such as data warehouse capabilities and management of subscribers' material safety data sheets, a legal requirement for chemical companies.

Cautious Optimism

Just because Envera has made it out of the starting gate is hardly a guarantee of its eventual success. Like all electronic trading exchanges and hubs, Envera faces enormous obstacles (see "Due Diligence," this page). For starters, it has new competition: a similar online exchange for the chemical industry dubbed Elemica. Elemica, a Philadelphia-based e-marketplace that went online in a test phase this past January, is also based on an XML platform,

and it is backed by 22 of the largest chemical companies, including BASF, Dow Chemical and DuPont. With Elemica in the picture, Envera may find it harder to sign up more companies as subscribers. Whether Envera can grow beyond its initial image as an extension of Ethyl presents another challenge. The e-hub will succeed only if industry companies see it as a neutral platform that exists for the benefit of all companies. The fact that the nine Envera owners are also its users could become a problem down the road.

Despite the uncertainty surrounding electronic exchanges, Envera has earned modest praise from some industry watchers. The chemical industry already has its share of trading exchanges, such as CheMatch.com and ChemConnect, that seek to match up buyers and sellers for spot buys of excess inventory. Emphasizing connectivity between established business partners is a fresh approach, according to Leif Eriksen, research director for AMR Research in Boston. Envera's strategy requires a great deal of independence, however.

"No [single] company must be allowed to dominate the platform," says Eriksen. If the balance of power were to tip in favor of one member company, fewer and fewer companies would use the hub, perceiving it to benefit the dominating company. That's always a danger, given that the four founders came from Ethyl, and Envera is located in Ethyl's hometown of Richmond. Mooney doesn't believe it's likely Ethyl will dominate, since it is the smallest company so far to invest in Envera. "There's no way from a business point of view that Ethyl will have too much influence," he says. "None of the partners can invest beyond a certain level. And each equity partner has one vote on the board."

So far, the strategy is working, says Eriksen, who cited Envera's quick launch with a minimum of interference from its board members as proof. But hard choices lie ahead, and corporate governance can get ugly very quickly. Eriksen believes Envera will have to go public one day or bring in capital from disinterested third-party in-

Due Diligence

What *not* to do before investing in an exchange or consortium

DON'T buy into the theory that electronic exchanges will enable a level of commerce never before seen by mankind. Despite the hype, no exchange will receive 100 percent of the spending in its industry.

DON'T believe exchanges will enable you to analyze all your data in one place. Since you won't ever do all your transactions on one exchange, data will reside in different locations.

DON'T get involved unless the exchange has a clear (and we mean *clear*) path to profitability. The exchange has no hope of survival without it.

DON'T invest money in an exchange without first finding out if you'll have to commit to a second round.

— L.G. Paul

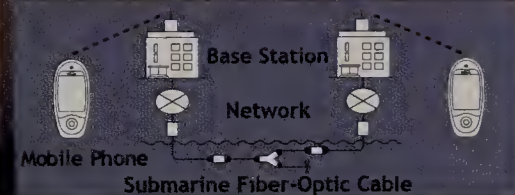
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vestors if it is to succeed long term because there is too much of a chance that the equity investors will use their voting power to make decisions that benefit them at the expense of the community platform. For example, Envera may need to spend a lot more money in the coming years sprucing up the platform's capabilities in order to attract more participants. But if the equity partners are satisfied with Envera as is and decline to invest more money, that could hurt the hub's chances of acceptance in the industry as a whole. "To be truly independent, you can't have owners that are users," says Eriksen.

Others are not convinced that Envera is pursuing the right strategy. John Moore, vice president at ARC Advisory Group in Dedham, Mass., says the funding model practiced by ChemConnect is preferable. "Envera has an open equity situation—take one, take all," he says. "How do you rotate the board when there are more investors? They don't seem to have that very well thought out." ChemConnect's 31 equity partners have no voting rights, something that Moore thinks is in the best interest of the exchange. Giesler acknowledges that these are legitimate concerns and says Envera is working toward converting its board to be 100 percent independent. This may prove difficult or impossible to do. "I don't know that they can go back now and try to take away the investors' votes," says Moore.

AMR's Eriksen has been watching Envera since its inception and believes it is further along than any other e-hub in its space. "I tend to be very skeptical about exchanges, but what they have done is much more, much faster than anyone else has. They're the leaders in this industry," he says. For Eriksen, however, corporate governance issues remain the huge dark cloud on the horizon—for all consortium trading exchanges, including Envera.

Where huge companies come together, governance gets awfully hazy, and it's tough to get even simple things done, never mind tackle hard issues like industry standards. With its three CEOs, the auto industry's Covisint is a case in point: Envera got up

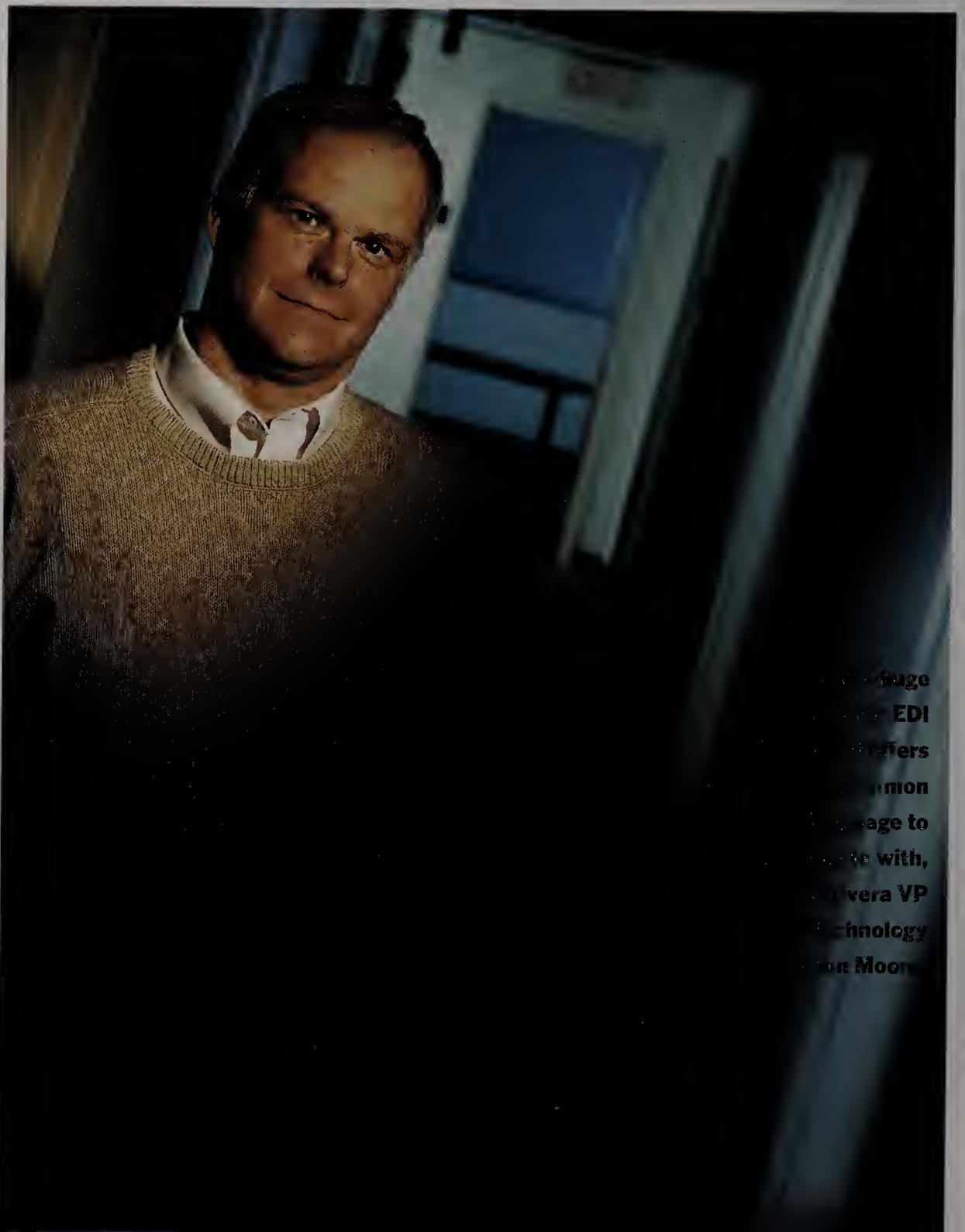
and running before Covisint, which was announced more than a year earlier.

The XML Question

The fate of XML is an especially big question. The standard markup language represents a breakthrough in one sense by giving companies a common language to use to transmit data over the Internet. This is a huge advantage over EDI, which requires participants to rent bandwidth on a costly private network. EDI failed to take hold in the chemical industry, unlike in the auto industry, for at least two reasons. First, chemical sales tend to be large on average (about \$20,000)

and often require more oversight than EDI allowed. Second, there were so many interested parties given the chemical industry's fragmentation that it was nearly impossible to agree on data standards. The Chemical Industry Data Exchange (CIDX) was formed in the late 1980s to work on the issue but was unable to garner enough clout to make a difference. "The standards they arrived at were lots of standards, which is effectively no standards," recalls Mason Moore, vice president of technology of Envera.

But just providing a standard language is not enough—syntax is needed too. For XML to be truly useful requires the definition of standard documents, such as a purchase order, to be used within the industry. And once those business documents have



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been defined, they must be widely adopted. In the chemical industry—as everywhere—multiple groups with multiple agendas are pursuing multiple standards. Envera has made quick progress on its eight initial XML documents, but a potential battle looms with competitor Elemica.

XML has an obvious advantage over EDI in that it leverages existing infrastructure (such as the Internet) and is therefore not expensive to adopt. And it does have some technical advantages. “In XML everything is defined by tags, and you can extend the document by adding more tags,” says Envera’s Moore. “Two partners can agree to a specific extension of a purchase order. That gives much more flexibility. You can also drop an XML stream on a piece of paper and read it. That’s not true for EDI,” which is only machine readable. But in the standards department, XML is no different from EDI. “There’s no guarantee that it will suc-

ceed. It will face the same problems EDI did,” says Eriksen.

“EDI was not a smashing success in the chemical industry because we did not come together around standards. We’re trying to learn a lesson from that,” says Johnnie Foster, vice president and CIO of Solutia, a \$2.8 billion chemical manufacturer in St. Louis. Solutia invested “several million” in Envera in part because it believes in XML’s potential to succeed where EDI failed.

This time around, there are hopeful signs. Envera has agreed to share its eight initial XML document definitions for use with CIDX for use by any company in the industry. However, the ability of competitors to coalesce around standards was immediately tested when Elemica announced last summer that it too was working on XML document definitions for a purchase order and an order acknowledgment, among others. Representatives from Envera and Elemica gath-

ered around the bargaining table and hammered out common definitions for the good of all. For their part, Mooney and Giesler say they’ll do what’s necessary to work out a common standard or arrange for Envera to map to different standards, as needed.

But one wonders how long the congenial atmosphere will last. It’s hard to cooperate when others fail to follow suit. Chuck Gruber, vice president of Elemica, emphasized that his group worked with CIDX, not Envera, on the initial documents. “We feel working with [Envera] would dilute the concept of what we’re trying to do,” he says. So, in effect, Elemica and Envera are working at cross-purposes, at least as far as Gruber is concerned. That’s bad news for the industry as a whole, especially since the Federal Trade Commission has said that it will look especially closely at any proposed trading exchange that attempts to limit interoperability with other exchanges.

Trouble in Paradise

According to AMR Research analyst Bruce Richardson, at least 7 major challenges face consortium trading exchanges (CTEs) like Envera:

Premature promises of functionality. Most exchange operators are too optimistic about delivery dates for functionality. CTEs often make promises before writing any code—even before selecting a technology platform. For at least the next two years, CTEs will have difficulty delivering more than auction, spot-buy and excess-inventory services.

Lack of consensus about where functionality should reside.

The debate still rages about whether applications should stay proprietary and behind the wall or nonproprietary and in front of the firewall. That must be settled.

Need to budget for the total cost of the exchange. The cost of developing a consortium trading exchange is in the \$250 million to \$500 million range, depending on a variety of factors. Few participants have an accurate handle on the time and expense required to integrate their existing systems into the trading exchange.

Competition. Envera faces competition from other emerging

XML-based exchanges like Elemica and existing trading exchanges like CheMatch.com.

Supplier recruitment, participation and integration. Many suppliers are skeptical of win-win promises. They view CTEs as an e-squeeze that will cut into profit margins or turn their products into commodities.

Marketplace-to-marketplace integration. While few CTEs are operational as anything more than auctions, major software providers are already talking about marketplace-to-marketplace integration. The functionality has yet to be stress-tested for homogeneous exchanges, and it is years away from use among heterogeneous exchanges.

Political infighting. Politics will play out within CTEs, to their detriment. Problems can arise when the CEO or board makes the membership decision without consulting those responsible for ensuring the success of the investment.

—L.G. Paul

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Private Versus Public

Even if XML works like a charm, Envera may have a hard sell on its hands, at least when it comes to convincing companies to shift the majority of their transactions its way. Although it never adopted EDI to any great degree, Occidental Chemical (OxyChem), a \$3 billion chemical manufacturer, saw the benefits of linking electronically to its partners. More than a year ago, OxyChem's OxyVinyl divi-

sion built an ERP-to-ERP connection to PolyOne Corp. (then called Geon Co.), one of its largest customers. "As a result, all the resin products that OxyVinyl supplies to PolyOne are hands-free, with no human intervention," says Charles Clark, former vice president of e-business for OxyChem in Dallas. "We saw significant value in terms of increased efficiency of operations. We've reduced the amount of inventory we were carrying."

But, much like the experience at Ethyl, Clark couldn't imagine building what amounts to a private exchange for every one of its customers, only for the cream of the

crop. "We were looking for a one-to-many solution where the idea is you connect only once," he says. OxyChem was one of Envera's first equity partners. The \$4 million investment OxyChem made in Envera was easy to justify for a company of its size, according to Clark.

Clark likes what he has seen so far from Envera. But he doesn't expect the platform will supplant all of OxyChem's other ways of doing business. In the next five years, Clark hopes, up to 40 percent of OxyChem's transactions will go through Envera. The rest will be homegrown private exchanges like the one OxyChem built with PolyOne, EDI and good old-fashioned techniques like phone and fax.

That a huge corporation like OxyChem will continue to endure the pain and effort of creating private exchanges with its most prized customers does not surprise ARC's Moore. "None of these marketplaces will ever get 100 percent of the spend," he says. "[Electronic exchanges] all have grand dreams of being able to take over all of their transactions for all their partners. It won't happen. Some companies may not want their most sensitive purchases logged on an online marketplace—no matter how bullet-proof the promised security measures." Even DaimlerChrysler is setting up an exchange—separate from Covisint—to source its strategic goods, according to Moore. An AMR Research report estimates that as much as 75 percent of the consortium revenue opportunity over the next two years could go to private exchanges that leverage the Internet.

For the moment, at least, Envera can be forgiven for savoring the fact that it has done what it promised in this early phase, which is uncommon in the exchange arena. "We set our goals and made our business plan. These haven't changed. We want to earn our trading members' trust," says Mooney. **CIO**

Let us know what you think of electronic exchanges at letters@cio.com. Lauren Gibbons Paul is a freelance writer in Waban, Mass. Send her an e-mail at lauren paul@mediaone.net.



Solutia CIO Johnnie Foster invested in Envera because he believed in XML's potential to succeed.

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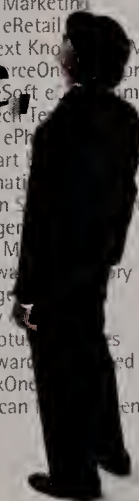
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*Federal agency CIOs could save you
billions through supply chain automation.
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Your Tax Dollars at Work?

BY REBECCA LYNCH

MaryAnn Guerra, deputy director for management with the National Cancer Institute (NCI), is in charge of making sure the agency runs smoothly so that its scientists can get on with finding a cancer cure. One of the scientists' requirements? Getting new microscopes when they need them.

In 1994, Guerra was getting lots of complaints that this basic equipment was taking too long to acquire. At the time, she was cochair of a committee that was looking into ways NCI could improve its efficiency. The scientists on the committee identified procurement as their number-one problem. Not only were they frustrated by how long it took purchasing agents to get them their tools, they thought the old-fashioned, paper-intensive procurement process cost too much. The scientists knew the emerging Internet could be used for purchasing, that it would be faster and that it would save money—money that could be used to fight cancer. They asked Guerra to make it happen.

She did. Guerra's committee held a competition that led to a partnership with a small private company, Cybersystems Technologies of Towson, Md., to develop

Reader ROI

- Learn how federal supply chain automation could save taxpayers money
- Find out why the government is falling behind the private sector in e-commerce
- Discover what federal CIOs want to do to catch up

an electronic catalog, ordering and accounting system. The IntraMall was born. But after two years of work preparing the site, almost nobody shopped. Only 147 orders were placed through the IntraMall in its first six months of operation. It wasn't until Guerra made using the site mandatory for the buyers who reported to her that traffic reached critical mass. Last year, with buyers from other groups in the National Institutes of Health (NIH), NCI's parent agency, also using it, IntraMall logged 12,000 orders and saved more than 90 percent on each transaction.

Online purchasing has already saved taxpayers between \$6 million and \$8 million, but that's a drop in the bucket when you consider that last year the IntraMall handled less than half a percent of the \$1 billion NIH spends annually on lab equipment. If all such orders were made online, the government could save an estimated \$100 million. And Guerra says now that the integration to the NIH financial systems is almost complete, NIH expects to save even more money and cut out more paperwork. Guerra's e-commerce efforts are being replicated in every federal agency as government CIOs attempt to reap the benefits of supply chain integration. Gartner estimates that the government could save taxpayers a whopping \$2 billion annually just by making routine purchases online. That's at least on par with what leading private companies save on the same

types of transactions. (See "Four Strategies," *CIO*, Oct. 1, 2000.)

Yet most federal agencies are still treating e-commerce as a set of one-off projects, rather than as a comprehensive strategy to automate their supply chain the way private companies are doing. The government spends \$200 billion on goods and services every year—more money than General Motors, the largest company in the Fortune 500, collects in revenues. But it still conducts all but 5 percent of its transactions using paper and the telephone, according to Gartner. The government doesn't even track in any systematic way how much it spends or how many bills it pays online.

With the potential to save billions just a virtual mouse-click away, why is the government still buying the old-fashioned way? Maybe because nobody is holding a gun to its head. Corporations have to watch the bottom line, but government agencies don't get punished financially for not saving money. "There's no one in charge of better, cheaper, faster," says George Molaski, CIO with the U.S. Department of Transportation (DOT), and cochair of the e-gov committee of the federal CIO council. "That's the crying need of government."

Off to a Good Start

The feds' adoption of e-commerce started the way most government initiatives do: with a study. In 1993, a report by the National

Performance Review, an effort to improve government management led by former Vice President Al Gore, said that by consolidating their purchases, agencies could save money through greater volume discounts and simpler administrative practices. Government IT executives concluded they could accomplish those goals through e-commerce. The next year, the Federal Acquisition Streamlining Act, which simplified government procurement rules, mandated agencies to do more business online using a network solution called the Federal Acquisition Computer Network (FACNET). This mandate was short-lived. The Internet rendered FACNET obsolete, and Congress eliminated the requirement to use it in 1995, leaving no legislation to further coax agencies into electronic-purchasing land.

Congress did give e-commerce many champions. The Clinger-Cohen Act of 1996 created CIO positions at each major U.S. department. The law put CIOs at the executive table, with the idea that each department would use IT more like private companies. CIOs promoted e-commerce by building new purchasing systems, like NCI's IntraMall, which use online catalogs from preferred suppliers and can process credit card orders.

Steven Kelman, a professor at Harvard University's Kennedy School of Government, was



MaryAnn Guerra, deputy director for management, National Cancer Institute:
IntraMall traffic reached critical mass when she required buyers to shop online.



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head of the Office of Federal Procurement Policy from 1993 to 1997, when agencies made their first forays into e-commerce. He says agencies automated this front end of the procurement process at the same pace as the private sector. But agencies are falling behind as they try to link online order processing to their financial and inventory management systems—and capture the huge payoff from supply chain automation. Many private sector companies haven't cracked this nut yet, either, says Kelman, but agencies are at a disadvantage because their back-office systems are older and harder to upgrade.

Losing Momentum

Molaski says the reason agencies have trouble keeping up is that they can't get Congress and many department executives to give sustained attention to e-commerce. The DOT, which is made up of 14 agencies, including the Federal Aviation Administration and the Coast Guard, has deployed three new purchasing systems since 1995. The department buyers regularly use credit cards for routine purchases, saving \$43.2 million in 1999. But even though its official policy is to buy online, not everyone subscribes to it. Two agencies, the Federal Railroad Administration, which has an \$870 million budget, and the National Highway and Traffic Safety Administration, which has a nearly \$390 million budget, aren't yet using one of the purchasing systems. And the DOT isn't keeping track of how much it buys through electronic methods.

Federal agencies are falling behind as they try to capture the huge payoff from supply chain automation.

Molaski wants help. He blames Congress for not giving his department's managers bonuses if they save money, and he thinks the same problem plagues other agencies. "We need a kick," he says. "Managers in industry are rewarded for implementing better, cheaper, faster; managers in government are not," he says. Most top government executives are political appointees who are judged instead on the success of their public policies. If agencies could set



**George Molaski, CIO,
U.S. Department of
Transportation:** *Managers
in government are not
rewarded for implementing
"better, cheaper, faster."*

up objectives, like speedier transactions or streamlined procedures, and be rewarded for meeting them, electronic purchasing could be the rule, rather than the exception, Molaski says.

David Litman, a civil servant who is the department's senior procurement executive, says political leaders would rather fund projects to improve transportation safety than fund ones for internal efficiency. While he didn't offer a specific example, he notes that the DOT built three purchasing systems because Congress wouldn't fund a project to build only one that every division could use. Left to its own devices, each unit had to decide how much of its budget, which is, by law, under its own control, to invest in e-commerce. "For smaller agencies, they have to look at what the investment means for them," he says, and they don't always conclude it's worth the money. Meanwhile, Litman says it's taking time to get buyers—whose work he does not directly supervise—to use the new systems because they're reluctant to change their work routines.

Some analysts think a head federal CIO, a position endorsed by President Bush and congressional Democrats, could pave the way for agencies to pursue the full benefits of e-commerce. (See "Hail to the Chief...Information Officer," *CIO*, Oct. 15, 2000.) Rishi Sood, a principal analyst with Gartner Dataquest in San Jose, Calif., says state and local government agencies are ahead of the feds in supply

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chain automation because their efforts are better coordinated. "At the federal level, agencies are putting in systems irrespective of one another," says Sood. "There needs to be a person who tries to set a strategic plan so that people abide by it and do it together." Jeremy Sharrard, an associate analyst at Forrester Research, doubts a head CIO could coordinate the 1,200 federal agencies. Still, he says, federal agencies "need to streamline and realize volume discounts. Someone at the helm to steer might be an answer."

No One in the Driver's Seat

The Department of Defense (DOD) is a good example of an agency that hasn't been able to execute a strategic plan for e-commerce. A report last July by the General Accounting Office (GAO) said DOD officials in charge of the department's e-commerce strategy had yet to draft a plan acceptable to all the military services and agencies. Such a plan, the GAO noted, would allow agencies to share e-commerce systems, which, to date, they have developed independently. Furthermore, the GAO said, the DOD CIO wasn't clearly in charge of e-commerce, which made it hard for him to command the rest of the department to go along with these projects.

The GAO noted that the DOD has made progress toward its goal of paperless procurement. In fiscal 1999, buyers used credit cards to make more than 90 percent of purchases costing \$2,500 or less (the limit allowed under law). But the report noted there are no reliable estimates of cost savings, partly because the Defense Finance and Accounting Service, which pays the bills, didn't start keeping track of how many fewer paper invoices it has to process until 1998. For more complicated transactions, the DOD is issuing nearly all of its solicitations and collecting bids electronically. But the same success isn't evident at the back end. As of December 1999, the report said, the DOD was handling paper invoices and cutting checks for 36 percent of its transactions. The DOD could be saving even more up front by making more routine purchases through its E-Mall, a set of online catalogs offering military and commercial products, like uniforms and office supplies. In 1999, only \$2 million worth of goods were purchased through the E-Mall—a tiny portion of the more than \$4 billion market the DOD anticipated. (The DOD counts these purchases differently and reported \$150 million in E-Mall sales out of \$6 billion bought with credit cards last year.) The idea of the mall is to reduce the cost of supplies through volume discounts from preferred vendors—just like private companies do. But at the time of the report, the DOD hadn't established many contracts with suppliers.

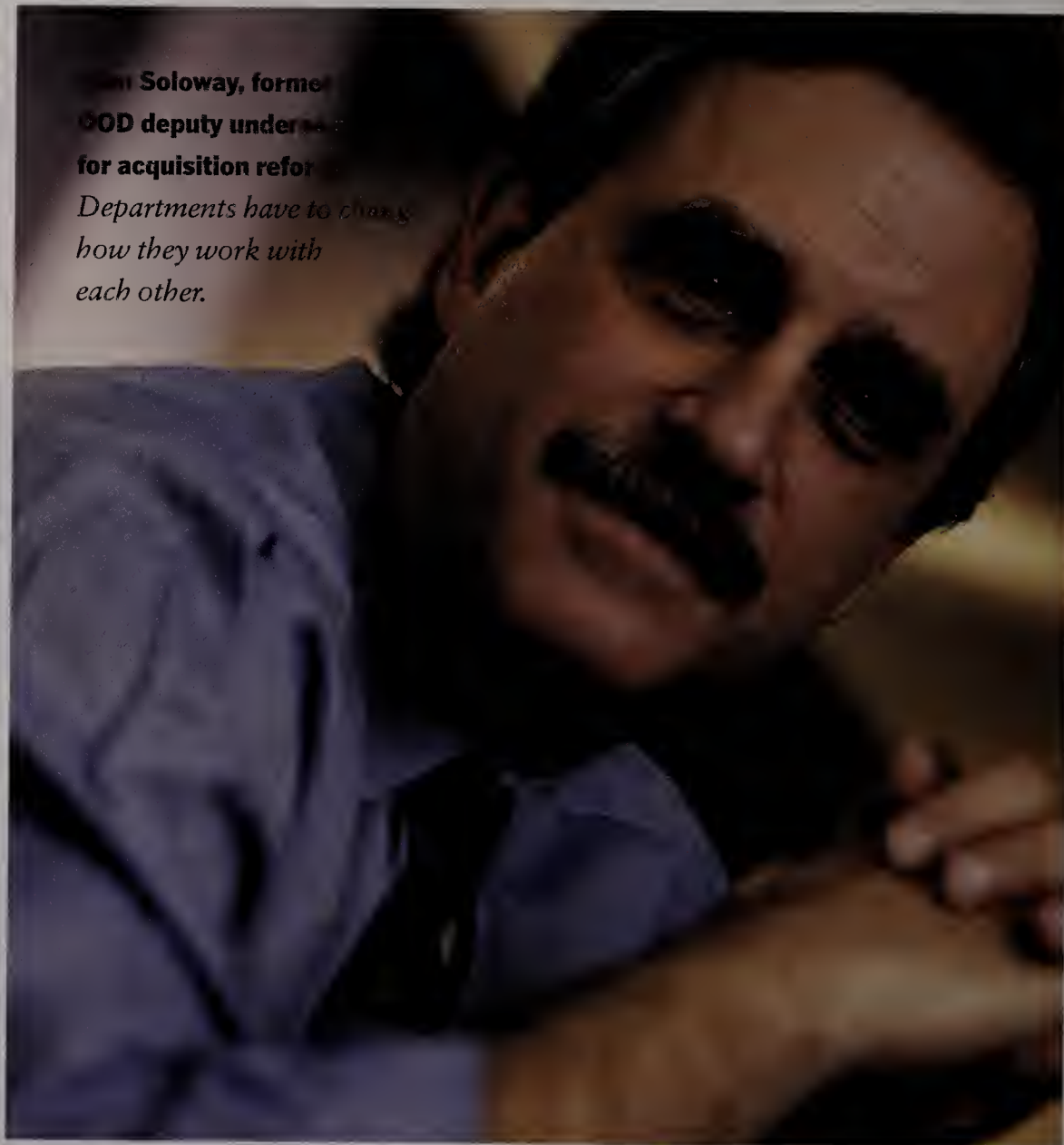
The E-Mall also wasn't reporting accounting and product demand data to the business managers making the purchases, which, the GAO said, diminished its use, and its benefits hadn't been quantified.

Arthur Money, DOD CIO, concedes the E-Mall numbers are still low. But he looks at the overall e-commerce picture and sees improvement. "Two years ago," he says, "the automation of payments was close to nonexistent—other than the issuing of paychecks. [Buying with] credit cards started slow, then most purchasers gained confidence and that's becoming more commonplace every day." He says the Army, Navy and Air Force are working together to build integrated purchasing, financial and inventory systems.

That's overstating the services' collaboration, says Christopher Baum, vice president for electronic government with Gartner. "The words *working together* give you the idea that they're walking hand in hand through fields. It's more like they're chained at the wrist, being chased through the woods," Baum says.

Stan Soloway, who was the department's deputy undersecretary for acquisition reform until January, when he became president of the Professional Services Council, an industry group, says there's no doubt the DOD has made progress. "I'm equally certain taking advantage of e-commerce involves all the departments operating together but differently from the way they have historically," he says. "Implementing

Stan Soloway, former DOD deputy undersecretary for acquisition reform, says:
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successful e-commerce requires everyone—finance, contractors, IT, procurement—to work together.”

Integration Frustration

Government officials say they also face special technical problems. Until recently, e-commerce software like that offered by Ariba and Commerce One required extensive customization to incorporate procurement practices that are unique to government, like audit trails that provide public accountability as to why a particular vendor's bid was accepted. Early software products were hard to integrate with the agencies' financial systems, which support government-specific accounting rules. “I don't think [vendors] fully understood public sector purchasing,” says Forrester's Sharrard. “At first, I think these companies were only talking cost savings; the government wasn't interested.”

But even when software supports the agencies' requirements, they don't integrate easily with older, back-end systems. “I look at those solutions, and they put me in the business of being a system integrator,” says Litman. “We need a product where they integrate it all without me having to do it.” Litman notes that the DOT tried unsuccessfully to link its new purchasing systems to the old financial systems. It didn't work, and now the department is installing a new financial system. Supply chain integration was an impetus for buying the new financial system, he says.

Meanwhile, Guerra has been working with NIH CIO Alan Graeff to expand the IntraMall's capabilities to include purchases that require more approvals than the credit card purchases it currently handles. One option is to build payment applications into the existing IntraMall,

The question is whether political leaders will start giving e-commerce more than lip service.

another is to buy a new system that includes purchasing and financial functions. A new system could take at least a year to redesign all that the agency has done on the IntraMall, Guerra says. “We could have an integrated IntraMall system up and running in six to nine months.” Graeff was unavailable for an interview.

Arthur Money, CIO, U.S.

Department of Defense:

Buying with credit cards is becoming commonplace at the DOD.



Now What?

Clearly, the federal government has to do much more to make e-commerce the rule rather than the exception. CIOs say they believe full supply chain automation offers government the same bottom-line benefits as it does the private sector. The billions they would save could be used—depending on your political philosophy—to cut taxes or spend more money on government programs. The question is whether political leaders who set agencies' priorities and the rank and file who would have to use new systems will start giving e-commerce more than lip service.

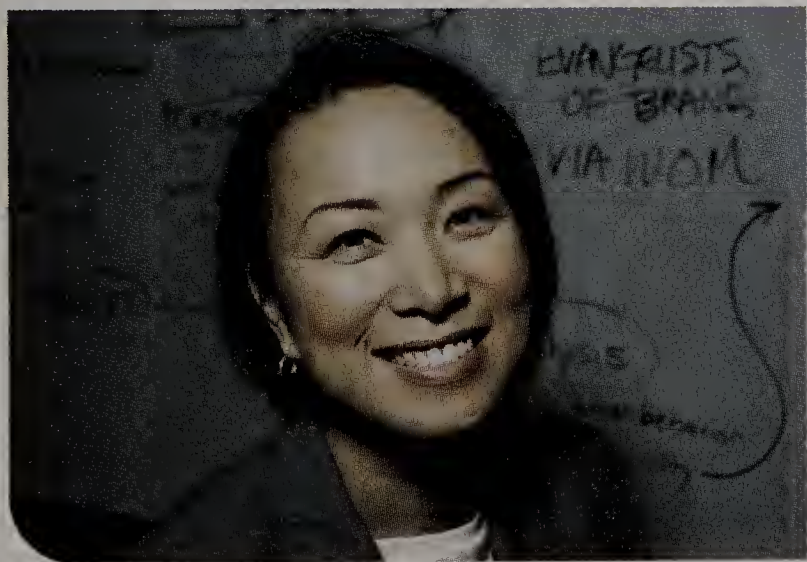
Guerra likens the impact of supply-chain integration to the days when PCs landed on everyone's desk. “Everyone asked themselves, ‘Is this really a benefit? I have to change everything. Do I want to?’” she says. “From a business perspective, it was the right thing to do, but that doesn't mean it's easy.”

Can they succeed?

“I don't think they have any choice,” says Soloway. **CIO**

What do you think? Send your ideas for how government can reap the benefits of supply chain automation to Senior Editor Elana Varon at evaron@cio.com. Freelance Writer Rebecca Lynch can be reached at peachymama@aol.com.

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Not Just for Music Anymore

Napster's revolution begins to sing a business melody BY JOHN EDWARDS

NAPSTER MAY be in trouble, but the same technology that has recording industry executives quaking in their Gucci loafers may yet find a home in corporate networks. "Peer to peer is here," says John Wollman, senior vice president of solutions at Alliance Consulting. Alliance, a New York City-based IT consultancy, is using

peer-to-peer (P2P) technology to tie its employees and customers together more tightly than traditional technologies ever allowed.

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on a network to act as servers to all other users. This means that individuals on a P2P network can freely share information and resources, such as applications, files and storage devices, providing an unprecedented degree of collaboration—or intimacy, as Wollman describes it.

But is P2P all that it's cracked up to be? Maybe, says James C. Smith, a senior analyst at the Hurwitz Group, a technology market research company in Framingham, Mass. "P2P builds on the Internet viewpoint of decentralized information access, so it's hard to argue against an approach that's been so phenomenally successful,"

he a particularly useful tool for organizations that have widely dispersed employees and clients."

After testing a P2P network for about seven months, Wollman is convinced that the technology is a good investment. Alliance is using P2P technology developed by Groove Networks, a Beverly, Mass.-based P2P software developer founded by Lotus Notes creator Ray Ozzie, to interconnect onsite workers and external employees and clients. (Other major P2P technology vendors include Gonesilent, Pointera, Roku and uRoam.) "Previously, we relied heavily on e-mail, fax and phone

Perhaps the biggest benefit P2P provides is easy, direct access to information.

he says. Using millions of servers worldwide, the Internet has made information access easy and ubiquitous from almost anywhere. On the other hand, P2P comes with some heavy baggage, including performance, management, security and legal concerns. "What remains to be seen is whether the advantages will overwhelm the drawbacks or vice versa," says Smith.

Affinity to Infinity

Perhaps the biggest benefit P2P provides is easy, direct access to information. By using P2P to create an "affinity community," an organization can allow employees and other interested parties to share a wide array of files on marketing, technical documents and other key matters. In such an environment, individuals cannot only view content but also move the information from a peer system to their own workstations (in the same way a Napster user can download a song from a fellow user's PC). "If you trade a lot of information from desk to desk this could be good for you," says Malcolm Maclachlan, media e-commerce analyst at IDC, a technology research company (and sister company to CIO's publisher, CXO Media) in Framingham, Mass. "P2P can

calls," says Wollman. Now, he notes, network users have open access to files, proposal development, job tracking and product management, all of which add up to "general meeting avoidance." "With peer to peer we can collaborate more closely on projects, which leads to a very high degree of customer intimacy," says Wollman.

And outside of a few glitches related to moving P2P data across a corporate firewall—fixed by making a few configuration changes—Wollman says the technology has worked flawlessly. "Nothing scary has happened to us," he says. "Stability, performance and scalability haven't been problems."

Distributing the Wealth

Distributed computing is another powerful P2P capability. P2P's resource sharing capability allows organizations to take computers that are sitting idle or wasting processing cycles on screen savers and consolidates them into a virtual supercomputer. Seti@Home uses this technique to search for extraterrestrial life by tapping more than 2 million computer users to analyze radio signals gathered by the Arecibo Observatory in Puerto Rico. (See "Waste

new products

COM-ing Unix

The Open Group has announced the release of **COMsource 1.1**, an open-systems, Unix-based implementation of Microsoft's Component Object Model (COM) middleware product for Windows. With the product, developers can create COM-enabled applications on Unix or port their existing Windows-based COM applications to Unix. The 1.1 version now includes support for Windows 2000, as well as Windows NT 4.0 service packs 4, 5 and 6. Customers can also purchase a support and maintenance service contract for assistance in using the product. Pricing begins at \$7,000. For more information, visit www.opengroup.org or call 650 323-7992.

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Not Want Not," *CIO*, Aug. 1, 2000.) Businesses can use the same approach to tackle an array of processor-intensive tasks, ranging from analyzing flu viruses to developing complex financial models.

Intel has been using a P2P network for distributed computing since the early 1990s. The architecture allows the company's California chip designers, for example, to take advantage of the abundant comput-

P2P can fail to live up to its promise. As more people access a P2P network, the increasing traffic can bump up against individual machines that are hobbled by slow Net connections or processors. Maclachlan says the ripple effects from these roadblocks can degrade network performance. "You want to be careful who you invite on to your P2P network for this as well as security reasons," he says.

P2P's lack of security and privacy looms as the technology's biggest pitfall.

ing power that's available on their Israeli colleagues' systems when it's nighttime in the Middle East. According to Intel, the technology has helped the company boost the overall use of its computing resources from 35 percent to 80 percent during the past decade, saving the chip maker nearly a half-billion dollars. "P2P helps organizations acquire more computing power without buying expensive new hardware," says Patrick P. Gelsinger, vice president and chief technology officer of Intel's architecture group in Beaverton, Ore. "It lets you better use what you already have."

Few companies have the internal computing resources of an Intel, so companies such as Entropia, Popular Power and United Devices have arrived to provide the software and services that allow organizations to harness the underlying computer power of everyday Web surfers. "Users can donate their spare computer time to an altruistic endeavor or sell or barter time for a commercial project," says IDC's Maclachlan.

Peer to There

Critics warn, however, that the technology shouldn't be viewed as a magic bullet. "P2P is a raw technology that has a way to go before it can enter the mainstream," says Hurwitz's Smith. "As CIOs know, early adopters often pay a high price for their boldness."

Network performance is one area where

P2P's inherent lack of security and privacy looms as the technology's biggest pitfall, says Neil Ward-Dutton, a principal consultant at Ovum, a London-based technology research company. "The idea of running others' work through your PC, and vice versa, may not be welcome in a business environment," he says. Ward-Dutton is also concerned that the wide-open P2P architecture could prove to be a ripe breeding ground for viruses. "You can restrict the system so that you can only read files and not write to anything, but then you restrict much of P2P's advantage," he says.

System administration can also be a nightmare, says Maclachlan. "As an administrator, how can you keep track of versions and authorization levels if everybody is accessing different versions from other network users?" There's also the problem of users distributing unlicensed or illegal content (child pornography, for example). "Monitoring this activity is virtually impossible, and its existence could leave organizations open to lawsuits and legal charges," says Maclachlan.

P2P vendors are aware of the issues, and many are working to create solutions. Groove Networks, for instance, let organizations create virtual workgroups that are safeguarded by a combination of password-based access control and encryption technology.

But some P2P advocates tend to brush

new products

Users can also reprogram any of the keyboard's keys and create keyboard macros that play back as many as 70 characters with a single key press. Pricing begins at \$479. For more information, visit www.kinesis-ergo.com or call 800 454-6374.

Terminal Management

Tricerat has unveiled **Desktop2001**, a Windows thin-client server management product designed to work in Windows 2000 Terminal Services and Citrix MetaFrame 1.8 environments. The product is intended to ease application deployments by providing a drag-and-drop interface for configuring user desktop and start menu items. At the same time, Desktop2001 affords additional security. The product's integrated Thorough Operation Restriction technology lets administrators lock down user environments, preventing the unauthorized use of Web applications and e-mail viruses. The product lists for \$1,699 per server (discounts are available). For more information, visit www.tricerat.com or call 410 715-4226.

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aside these concerns. "There's nothing wrong with P2P that can't be fixed or worked around," says Kelly Truelove, CEO of Clip2, a Palo Alto, Calif., consulting and software company that works with P2P developers. Truelove is confident that the built-in trust of P2P users (everyone pursuing a common goal) and basic security precautions (such as requiring each user to run an antivirus program) will take care of most P2P headaches. He also believes that some of P2P's perceived problems simply aren't based on fact. "Despite the virus concerns, I have yet to read about any widespread virus outbreaks among the millions of Napster users," he says. But Kelly qualifies his comments by noting that most P2P file sharing apps, including Napster and Gnutella, have been used mostly for media files, such as video and audio—and such formats are poor carriers of viruses. He cautions that widespread sharing of programs and scripts could present a different story—and a different set of problems.

As P2P picks up steam, its proponents feel that it's only a matter of time before the technology does become widespread. In addition to the creation of affinity communities and distributed computing environments, P2P is also being touted for the online marketing of music, software and other products and services—a "peer-tailing" approach under which customers distribute products and services—as well as for the rapid distribution of virus antidotes and software upgrades across corporate networks. MyCIO.com, the Internet security subsidiary of Network Associates, already offers a P2P antivirus distribution technology with its VirusScan ASaP service. "We're seeing the dawn of a new networking era," says Truelove. "There's certainly plenty of hype surrounding P2P, but the hype is not entirely unjustified." ■

John Edwards' work has appeared in *The New York Times*, the *Washington Post* and many other publications. You can contact him at jedwards@john-edwards.com. Research assistance provided by Eve Keiser.



PREDICTIONS budgets

Still Growing Strong

THE YEAR 2000 was a banner time for IT spending and staff workloads, according to the "2001 Worldwide IT Benchmark and Trends Report" from Stamford, Conn.-based Meta Group. And even economic slowdowns and dotcom heart failures won't completely cap the trend in the coming months.

The report, which covers topics ranging from spending to staffing to productivity, states that IT spending grew 8.7 percent in 2000. Report author and research fellow Howard Rubin says that unless we see some more bad economic surprises, Meta predicts a 10 percent increase in overall spending in 2001. But, Rubin notes, that won't be the case for every business sector. "We're finding it happening on a sector-by-sector basis," he says. Industries such as banking and finance that have been on a spending roll will begin to cut back slightly, while sectors such as media and manufacturing continue to increase spending, he predicts.

The report also indicates that IT managers are getting more time for their buck from employees. Working hours increased 36 percent in the United States in 2000, though Rubin says some of that increase is because of improved reporting combined with a change in what is defined as work—such as on-the-job training. This doesn't mean, however, that employees will start living at the office. Rubin says the situation will stabilize before the IT shop and the sweatshop become indistinguishable.

—Christopher Lindquist

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REVISIT middleware

The Great Communicator

Middleware has become the glue that ties IT together

BY FRED HAPGOOD

FOR MOST OF THE HISTORY of digital communications, the technology has had at least one human in the middle of the loop; messages have flowed either from one person to another or from a human to an application and back. Examples of the third possibility—communications among applications—were rare and marginal. When need did arise, developers usually coded the required connections on the spot, by hand.

In the 1980s, however, real-time app-to-app communication, as expressed in simple applications like file transfer protocol clients and EDI gateways, became important enough to attract the efforts of standardization committees. By the end of the decade demand had grown to support a new industrial sector devoted entirely to products that facilitated this new category of network conversation. Such conversa-

tions included remote file access systems, which allowed applications to fetch objects (such as code, drawings and applications) from other servers. Other examples involved data access systems, which allowed a database built with one set of data models, formats and interface configurations to pull information out of others organized around different assumptions.

These new communication facilitators were called middleware. No marketing exec would have approved such a vague and nondescript term, but it caught on anyway. In 1992, we ran a piece evaluating the trend. We felt the importance of middleware was that it allowed managers more vendor choices by lessening the compatibility issues that made mixed, intercommunicating systems such a headache. (We jokingly called it "escapeware.") Middleware, we wrote, "offers users...the freedom



new products

Port Authority

Upgrading systems to handle the latest peripherals is as easy as adding **Belkin Components'** new **FireWire/USB ComboCard**. The Peripheral Component Interconnect bus card includes three (one internal and two external) Institute of Electrical and Electronics Engineers 1394 (FireWire) ports and two external Universal Serial Bus (USB) ports. The card comes complete with a pair of digital video editing software packages and supports most standard USB and FireWire peripherals, including printers, keyboards, disk drives, mice, scanners, video cameras and more. The card lists for \$109.99. For more information visit www.belkin.com or call 310 898-1100.

XML Does Linux

Software AG has announced that its Tamino native XML database is now available for Suse Linux's Linux Enterprise Server for the IBM S/390 mainframe. According to the companies, the S/390 is capable of supporting as many as 30,000 virtual Linux servers at one time, making it suitable for enterprise-class applications. Pricing is based on the performance level of the system in which it will be installed. For more information, visit www.softwareag.com or call 925 242-3700.

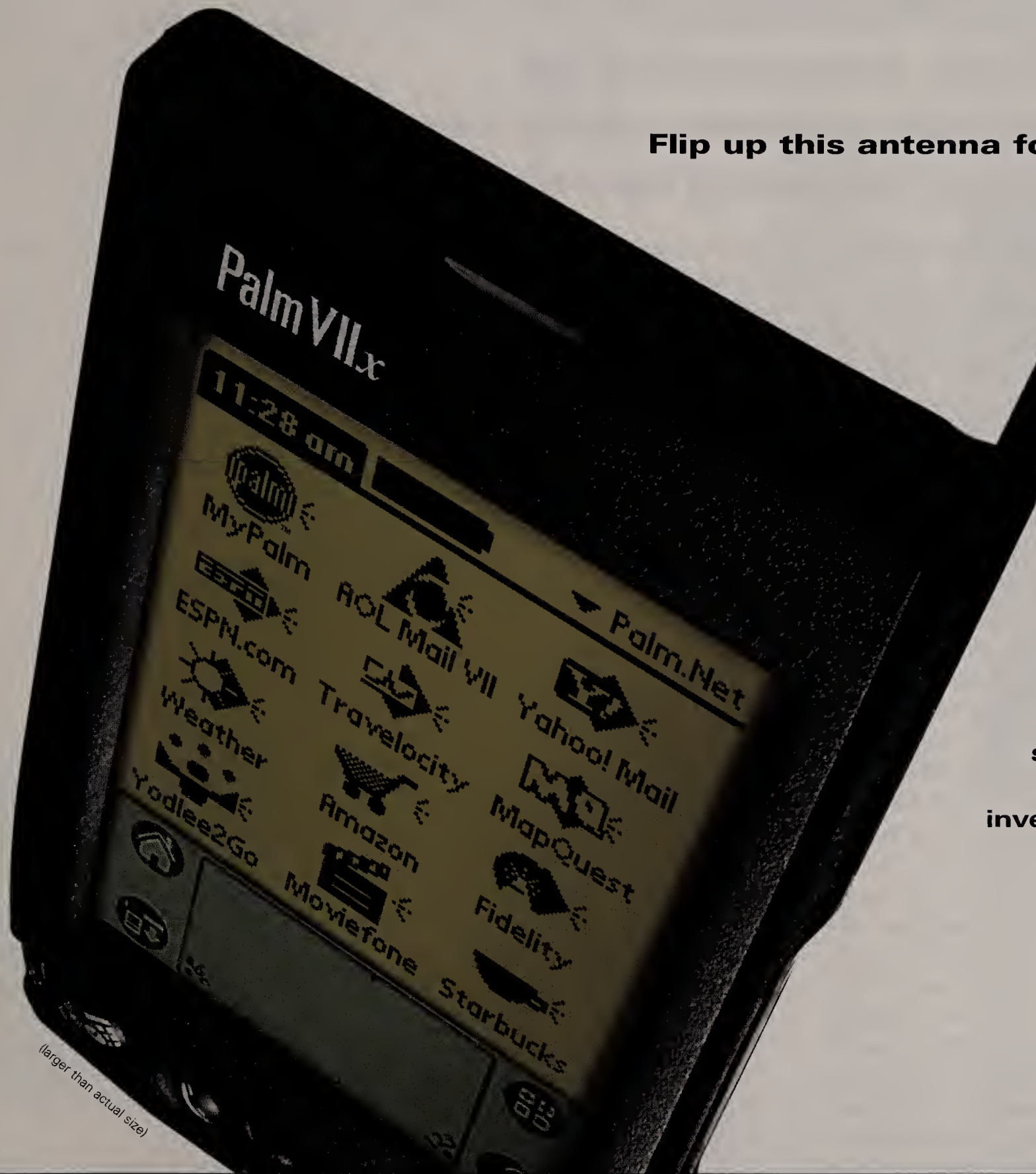
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to switch software parts without undue penalties." In other words, the system itself was fixed; middleware simply opened up more ways of putting the pieces together.

Middleware is a complexity tamer. In a static world, where protocols, technologies and performance specifications stay stable, it would not be needed. Applications and operating systems could be tuned to each other as tightly as nec-

course to absorb networking software entirely. One popular genre is "application integration," using middleware to combine applications across several product types into a single virtual application. (According to Gartner, product license revenue for integration broker suites came in at \$1 billion in 2000.) An even more general use of middleware is to build a "meta-application program interface" that floats

In our world, interconnection and interoperability problems require their own suite of fast-moving specialists.

essary. In our world, interconnection and interoperability problems require their own suite of fast-moving specialists.

In the early 1990s, the arrival of Windows, the general adoption of networking through business, and the explosion of client server systems drove the middleware sector to expand into a new range of functions, including system resource management, message routing, queuing, load balancing, delivery control, error recovery, timing and security, including authentication and authorization. In a recent report, Gartner found that more than 95 percent of all distributed processing uses some form of middleware. "Middleware is the 'slash' in client/server systems," observes David Linthicum, chief technology officer of middleware maker Saga Software. If nothing else had happened, perhaps over time these features would have drained back into apps and operating systems, but in the middle of the decade another, even more energetic, wave of complexity arrived with the need to build network applications that worked across WANs and the Internet. Managers started to talk not just of three-tier systems (app to middleware to app to middleware to app) but four- and five-tier systems. Middleware began needing its own middleware.

Today middleware seems almost on

above network resources, providing an interface that will look the same year after year, regardless of what happens to the mix of underlying apps.

While these meta-APIs are often specialized (for example, directory or security services), the trend seems to be toward using middleware to build a high-level control console that embraces all the issues arising in network development. According to Brad Rodgers, director of e-business at DMR Consulting, a business services consultancy in Edison, N.J., this is not just programming by another name. A meta-API simplifies and standardizes development, making the introduction of changes closer to configuring an application than programming one. That change demystifies development, allowing closer supervision and more management input while protecting the system from the bugs and glitches that get spawned when tinkering with basic code.

In short, middleware seems on track to take over the heart of network development. Perhaps in a few years operating systems and applications will start to slip off the screen of concern. We'll know that's happened when people start referring to them dismissively as "edgeware." ■

Send your opinions about middleware to Technology Editor Christopher Lindquist at et@cio.com.

new products

Safe and Secure

Network Flight Recorder has unveiled a new product designed to keep hackers from hiding their tracks after they infiltrate corporate networks. The product, **NFR Secure Log Repository**, consolidates network log data into a single secure location, allowing network administrators to review it for clues to possible break-ins while preventing hackers from being able to remove evidence of their actions from the logs. Pricing for the product begins at \$4,500. For more information, visit www.nfr.com or call 240 632-9000.

Better Backup

Businesses built around Microsoft Exchange 2000 can take advantage of Computer Associate's latest release of its **ArcServe 2000 Backup Agent** for Microsoft Exchange. The updated backup product offers several new features, including protection for the Microsoft Information Store, incremental and differential backups, support for Microsoft Exchange Clusters, and the capability to browse multiple Exchange servers. The product is available now for a list price of \$395. For more information, visit www.ca.com/arcserve.



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COVER ILLUSTRATION: VALERIE SINCLAIR

JOIN US AS WE EXPLORE

the forces

shaping this dynamic environment, and examine the resulting intersection of IT with a whole new host of legal, ethical, cultural, human resource, and business issues. We'll look at how the near and long-term future of technology will only accelerate these processes.

In this turbulent new world, we'll need to continuously re-evaluate and reinvent — maybe even get revolutionary. And who better to lead the revolution than Gary Hamel, the man *The Economist* calls "the world's reigning strategy guru." Hamel will help us cross the boundaries between old and new ways of thinking about strategy innovation, wealth creation, and the

very process of continuous re-invention. He'll deliver Tuesday afternoon's keynote address, and will be on hand afterward during a networking reception. Participants will receive a signed copy of Hamel's newest book, *Leading The Revolution*.



Gary Hamel
Author
Leading The Revolution

Joanne Ciulla, author of *The Working Life: The Promise and Betrayal of Modern Work*, questions where we're heading as a society — and what that means for us as employees and employers. We'll examine how new technologies are blurring the line between our work and personal lives.

Without *B*oundaries:

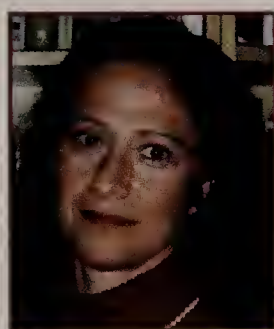
THE CIO IN THE NEW WORLD

Hackers and cyber terrorists recognize no boundaries. **Stephen Colo**, CIO of the US Secret Service, will continue our series of dialogues with The US Department of Commerce's Critical Infrastructure Assurance Office (CIAO) to discuss what business leaders, CIOs, and government agencies can and should be doing to protect against future attacks.

Edward Nesta, senior vice president of Operations and CIO of The Leading Hotels of the World, suggests how we can use technology to level the playing field when different countries, cultures and personnel are involved in selling and supporting products and services. **Mike Ragunas**, CTO of Staples.com, shares how we can implement and leverage technologies across sales channels, partners, suppliers and customers to improve service. NASDAQ's CIO **Gregor Bailer** and CTO **Steven Randich** exemplify some of the shifts taking place within the IT organization, where an increasingly complex set of responsibilities demands creative structures. Conference moderator **Dr. Jim Wetherbe** provides practical insight on rethinking and redesigning organizations and their boundaries.

A panel of emerging market CIOs from

around the world, moderated by **Martha Gorman** of the Global IT Knowledge Forum, examines how we can work together to lessen the digital divide between the technological haves and have-nots around the world, and why that's critical to a healthy global economy.



Joanne Ciulla
Author
*The Working Life:
The Promise and
Betrayal of
Modern Work*

Rick Richardson, president of Richardson Media & Technologies, looks at the new trends in technology, and offers his forecast for the future. And, Venture OnStageSM, moderated by CIO Magazine Technical Editor **Chris Lindquist**, once again brings five visionaries to talk about what their new technologies, products or services can do for CIOs.

But don't forget the fun stuff: Tee off Sunday morning at the Leaderboard Classic Golf Tournament hosted by Lockheed Martin and Intira Corporation. Network Sunday night at the Welcome Reception, and then laugh 'til you hurt at an Evening at the Improv, hosted by Information Builders. More activities will be scheduled throughout the event, capped off Tuesday night by the CIO-sponsored Reception and Dinner followed by Monte Carlo: An evening of High Rolling, Cool Jazz & Sweet Cigars hosted by Symantec Corporation.

SUNDAY, APRIL 22

8:00 am - 1:30 pm

Leaderboard Classic Golf Tournament
Hosted by Lockheed Martin and Intira Corporation

2:00 pm - 6:00 pm

Informal Networking

2:00 pm - 5:00 pm

Registration

6:00 pm - 8:00 pm

Registration & Welcome Reception

Get connected: Meet your fellow participants, featured presenters, CIO staff, and Corporate Hosts.

8:00 pm - 10:00 pm

Evening @ The Improv

Hosted by Information Builders

Back by popular demand, Information Builders presents "A Night at the Improv." Join us for an evening of sidesplitting fun — direct from the world-famous Improv Comedy Club in L.A.!

10:00 pm - Midnight

Hospitalities/Networking

7:30 am - 8:30 am

Breakfast

8:30 am - 8:45 am

Welcome and Opening Remarks



Gary Beach
Group Publisher
CXO Media Inc.

8:45 am - 9:30 am

Breaking the Boundaries



Moderator:
Dr. Jim Wetherbe
Professor of IT
Texas Tech University

Most organizations are based upon 18th century accounting systems and 19th and early 20th century industrial organizational structure. Both interfere with performance and employee satisfaction. The 21st century knowledge-based economy requires organizational design and leadership that breaks down the borders between interorganizational boundaries similar to the way business reengineering broke down the boundaries between intra-organizational functions in the 1990's. Wetherbe will set the stage for the conference and provide practical insight on rethinking and redesigning organizations and their boundaries.

9:30 am - 10:30 am

Integration across Enterprises



Mike Ragunas
CTO
Staples.com

E-business is a core component of any business strategy today. For companies to get ahead in today's e-economy, e-business initiatives must eliminate boundaries to create a seamless organization. Staples has been recognized for its success in implementing and leveraging technologies that integrate information across sales channels in its own organization, with partners, suppliers and most importantly, customers. This session will discuss ideas on how technology can drive your business and how Staples has leveraged XML and other technologies to successfully integrate across enterprises, resulting in improved customer service.

10:30 am - 11:00 am

Coffee Break

11:00 am - 11:45 am

Business Briefings

Our Corporate Hosts and their clients discuss technologies and services to improve your enterprise's performance.

11:55 am - 12:40 pm

Business Briefings

12:45 pm - 2:00 pm

Working Lunch — Without Boundaries: The Law vs. Hackers and Cyber Terrorists

Stephen Colo
CIO
United States Secret Service

In the Internet world, hackers and cyber terrorists recognize no boundaries. Major hacker attacks are not only becoming more prevalent, but also far more dangerous to business and government. The US Department of Commerce's Critical Infrastructure Assurance Office (CIAO) asserts that business leaders and CIOs need to take more responsibility for systems and information security — but attacks will still happen. What help is available from law enforcement agencies and the legal system? And how can we help them help us?

2:15 pm - 3:00 pm

Business Briefings

3:15 pm - 4:15 pm

Without Boundaries: The Blurring Line Between Work and Life

Joanne Ciulla
Author
The Working Life: The Promise and Betrayal of Modern Work

Technology, the Internet and the global economy have created a 24/7 world. With laptops, cell phones, and a host of other handy gadgets, we can now work anytime, from anywhere. But just because we can, are we encouraged and expected to ... drag the laptop with us on vacation, have our office voice-mail forwarded to our personal cell phones, be virtually on-call all the time? The line between work and personal life gets blurry. Are we using these technologies to enrich our employees' lives by giving them more flexibility, or are we using them to pull the leashes to the office ever-tighter? What can and should we be doing to keep work from ruining our employees' lives?

4:15 pm - 5:15 pm

Technology & Our eFuture

Dana R. (Rick) Richardson
President
Richardson Media & Technologies

Today's CIO is faced with an ever-changing future. It is one characterized by fewer traditional boundaries and being shaped by trends in hardware, software and communications. Rick Richardson will provide his vision of both our near and longer-term future as it relates to these trends, as well as new and emerging technologies that will help bring those trends to reality. Finally, Rick will put himself on the line with his forecasts of our technological future and where the new boundaries might be drawn.

5:15 pm - 6:00 pm

Venture OnStage

Moderator:
Christopher Lindquist
Technology Editor
CIO Magazine

Venture OnStage, introduced at our October *Perspectives*® conference, was a hit with the audience, so we're bringing another group of new technology visionaries to tell us what they think will be the next great thing.

6:00 pm - 7:00 pm

Networking Reception

7:00 pm - Midnight

Hospitalities/Networking

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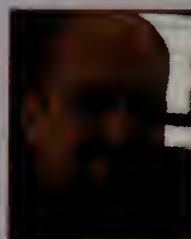
7:30 am - 8:30 am

Breakfast

8:30 am - 9:30 am

CIO vs. CTO: Where Do the Boundaries Lie?

Gregor Bailar
Executive Vice President & CIO
The Nasdaq Stock Market, Inc.



Steven Randich
Executive Vice President & CTO
The Nasdaq Stock Market, Inc.

There used to be a clear distinction between the CIO and CTO roles. The CIO was the business-savvy leader who helped the enterprise make wise technology investments, while the CTO was the chief lieutenant with a keen eye on emerging technologies that might help the business. Today the boundaries between the roles have blurred, creating confusion among business leaders: do they need a CIO, a CTO, or both? At NASDAQ, CIO Gregor Bailar recently hired CTO Steven Randich. They will discuss the distinction they see between the CIO and CTO roles, the boundaries and overlaps of their day-to-day duties, and how other businesses might address their own CIO/CTO needs.

9:30 am - 10:30 am

Beyond Borders: How Do We Level the Playing Field?

Edward F. Nesta
Senior Vice President of Operations & CIO
The Leading Hotels of The World

Technology can help level the playing field when different cultures, countries and personnel are involved in selling and supporting a company's product. CIOs have the responsibility for providing the tools, training and infrastructure that makes this possible — and for establishing and managing standards across time zones and cultures to create a consistent product. With the global reshaping that has resulted from the distribution of technology, the actions of CIOs, both economically and politically, are much more visible on the world stage. Their ability to support their respective business units, while also delivering a uniform and consistent product in the midst of these changes, is a necessity for both competitive and personal reasons.

10:30 am - 11:00 am

Coffee Break

11:00 am - 11:45 am

Business Briefings

11:55 am - 12:40 pm

Business Briefings

12:45 pm - 1:45 pm

Luncheon

2:00 pm - 3:00 pm

Narrowing the Digital Divide - International CIO Panel

Martha Gorman
Co-Founder
Global IT Knowledge Forum

Rather than create a world divided into information haves and have-nots, we must level the playing field for vast regions of the planet — or risk losing the contributions they can bring to the global economy. One way to accomplish this is bypassing expensive, intermediate solutions, in a process known as technological leapfrogging. Our panel of CIOs from emerging international markets discuss how we can work together to create the conditions needed to foster such technological leaps in key industries and regions.

Panelists:

Luiz Alberto Mourellos Rodriguez, Director TI, IDICT, La Habana, Cuba

Manuel E. Ruiz Gutierrez, MIS Manager, Dole Standard Fruit Co., Costa Rica

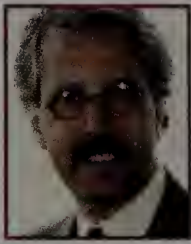
Wan Othman Wan Yahya, CEO, Integrated Document Services, Kuala Lumpur, Malaysia

Dr. Ian Kadish, IT Director, Netcare, South Africa

3:00 pm - 3:45 pm

Business Briefings

4:00 pm - 5:30 pm

Keynote: Strategy, Innovation and Continuous Reinvention**Gary Hamel***Author**Leading the Revolution, Competing for the Future*

Visiting Professor of Strategic and International Management

London Business School

In an increasingly non-linear world, only non-linear strategies will create new wealth. Yet few companies seem able to spawn imaginative, wealth-creating strategies. Any company that wants to thrive in the turbulent new economy will have to learn how to harness the passion and imagination of every employee in the quest for strategy innovation. It will have to learn how to reinvent itself not once a decade, in the midst of a crisis, but year by year while still at the peak of performance. "Industry revolutionaries" are upending conventions and aggressive newcomers are challenging the orthodoxies of incumbents. In this topsy-turvy environment, irrelevancy may be a bigger risk than inefficiency.

5:30 pm - 5:45 pm

Closing Remarks by Moderator Dr. Jim Wetherbe

5:45 pm - 7:00 pm

Networking Reception with Gary Hamel

7:30 pm - 9:30 pm

**Dinner
Hosted by CIO**

9:30 pm - 11:00 pm

Monte Carlo: An Evening of High Rolling, Cool Jazz & Sweet Cigars*Boca Raton Beach Club***Hosted by Symantec Corporation**

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Perspectives community. Spend some extra time before or after the conference, bring the family — but make your reservations now because space is limited and it's prime vacation time! Call the resort at 561 447-3000, and don't forget to mention you'll be attending CIO *Perspectives* to get our special rate.

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ACXIOM CORPORATION, a global leader in real-time, multi-channel Customer Data Integration, enables businesses to develop and deepen customer relationships by creating a single, accurate view of their customers across the enterprise. Acxiom achieves this by providing data integration technology, database management services, and premier customer content through its AbiliTec, Solvitur, and InfoBase products, while also offering a broad range of information technology outsourcing services. Founded in 1969, Acxiom (Nasdaq: ACXM) is based in Little Rock, AR, with locations throughout the U.S., and with operations in the United Kingdom, France, Spain, Australia, and Japan. Acxiom revenues were \$964.5 million in the fiscal year ended March 31, 2000. For more information, please visit www.acxiom.com.

Changing Privacy Issues to Opportunities

Given the continued growth of e-commerce, the proliferation of marketing databases and a surge of negative media attention, consumer privacy concerns and legislation continue to intensify. Businesses must address privacy issues quickly and legitimately or face the prospect of additional governmental regulation and rising consumer distrust. How can technology assist companies in implementing a pro-active consumer privacy strategy? Customer Data Integration (CDI) software can help companies honor individual privacy rights and manage customer preferences by integrating customer data across the enterprise — creating a single-view of the customer across multiple channels. This enables businesses to move beyond privacy protection and toward consumer advocacy. In this session, you will discover how true consumer advocacy represents a significant opportunity for businesses to improve customer loyalty, boost retention and increase market share.



AVAYA, the former Enterprise Networks Group of Lucent Technologies, is headquartered in Basking Ridge, N.J., USA, and is a leading provider of communications systems for enterprises, including businesses, government agencies and other organizations. Avaya offers voice, converged voice and data, customer relationship management, messaging, multi-service networking and structured cabling products and services. It is a worldwide leader in sales of messaging and structured cabling systems and a U.S. leader in sales of enterprise voice communications and call center systems. Avaya has nearly one million business customers in more than 90 countries, including more than three-quarters of the *Fortune* 500. For more information about Avaya, visit us on the Web at www.avaya.com.



John Stevenson
Vice President & CIO
Avaya

Moving a Corporation to a Forecasting Model 'Without Boundaries'

Many corporations, even in the new millennium, still await information that is historical in nature before making decisions that affect where the corporation needs to be prioritizing its resources. ERP applications have brought us real time information views across the corporation, but is that enough? To transform a corporation into a true forecasting organization takes information tools, seamless integration and a cultural transformation. Avaya is making this transformation. It is midway through the steps on its 18 month path from history gathering to a forecasting view of running its business. This session will focus on the tools, activities and cultural boundaries encountered in this transformation.



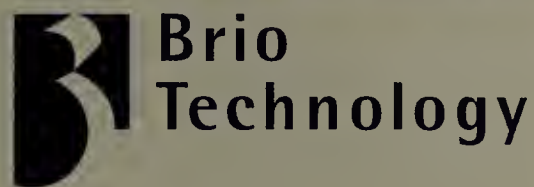
BLUE MARTINI
S O F T W A R E

BLUE MARTINI SOFTWARE provides enterprise software applications to understand, target and interact with customers. Companies deploy the Blue Martini Customer Interaction System to interact with customers on the Web, via call centers, in stores, over wireless devices, through e-mail, direct mail and on marketplaces. Business people use the Blue Martini Customer Interaction System to manage products, content, transactions, analysis and personalization. Companies that interact directly with customers build their brands more effectively than those using only traditional media, resulting in increased revenues across all channels.

Monte Zweben
CEO & Founder
Blue Martini

Driving B2B Revenues: Direct, Indirect, and Trading Exchanges

According to AMR Research, B2B e-commerce should reach \$5.7 trillion in 2004 or 29% of the dollar value of all commercial transactions. B2B e-commerce will be huge and will have a significant impact on the enterprise. Thus, for most companies, it is not a question of whether they must participate in B2B e-commerce, but one of when and how. But what is B2B e-commerce? How do you achieve the promise of B2B e-commerce while complementing your existing channel models? Zweben leads a discussion on how to enable contract-based e-commerce relationships with your B2B customers, empower your resellers to sell better, and participate in trading exchanges without commoditization.



BRIO TECHNOLOGY provides a proven and reliable analytic software platform that enables companies to simplify the complex process of using corporate data to make better day-to-day decisions. Brio ONE products empower individuals, workgroups and executives in an organization to find, access, share, manage, and exchange information across an Internet enabled enterprise. More information can be found on our web site: www.brio.com or by calling 1-877-289-BRIO.



Katherine Glassey
Chief Strategy Officer
Brio Technology, Inc.

Without Limits: A 360° View of Your Enterprise

Today's changing business climate makes it essential that information is readily available and in actionable form at all levels of the organization. As competition continues to escalate, both large and small companies are having to analyze not only external factors (i.e. competition, marketshare, etc.) but its own operations, including expenses, sales, and profitability at a departmental level. Looking at it from a CIO's perspective, this discussion highlights how the market has changed, where it is going, and how an organization can become successful, one department at a time. Glassey shares how analytics are essential in today's leading organizations to become more efficient — empowering employees, partners and customers with the ability to access and analyze business information.



In business nearly 25 years, **CANDLE CORPORATION** is one of the world's largest independent global software companies specializing in fast, flexible e-business solutions. Operating in over 42 countries, Candle develops and markets over 300 products and services that enable companies to create, integrate, manage and measure the effectiveness of their e-businesses. Candle's solutions provide the speed, agility and performance that are mandatory for success in the world of e-business. Visit Candle at www.candle.com.



David Caddis
Vice President and
General Manager of
e-Business Assurance
Solutions
Candle Corporation

Customer Service in an e-Business World

As companies experience unprecedented online activity, CIOs are striving to ensure that their Web site and applications keep pace with the fast moving world of e-business. Caddis will explore best practices to guide CIOs in developing a business model for today's ever changing Internet economy while assuring the quality of service received by online customers.



CHANGEPOINT provides the most complete business process automation solution for IT services organizations to manage their people, projects and budgets more effectively and profitably. Designed specifically to address the needs of IT professional services organizations, corporate IT departments and the staffing companies they work with, Changepoint enables IT services organizations to better operate by automating and streamlining critical business processes for greater efficiency, and inter-operate by seamlessly integrating and collaborating with staffing suppliers, contractors, clients and partners.



Avery Cloud
Vice President and CIO
INTEGRIS Health

Courtesy of
Changepoint

The Changing Role of IT in Today's Corporate Culture

In today's information technology age, the IT department is not only relied upon to support the business, but to drive the business forward. Cloud offers his insight on the ways that IT now fits into the corporate culture, touching on how the relationship of professionals and the business operators has evolved over his 25 years of IT experience. Cloud will share some of his experiences on the role of technology in shaping the business plan and how that role should be defined, as well as outlining the new structure that IT organizations must adopt.



Chordiant

CHORDIANT delivers a unified CRM (customer relationship management) solution for companies with extreme customer demands in terms of volume, complexity and scope. By integrating multiple sources of information across an enterprise, Chordiant Unified CRM Solution provides a comprehensive, single view of the customer to ensure personalized one-to-one service. Regardless of the point of customer contact — email, telephone, wireless device, Internet — companies can make the most of every customer interaction, increase retention, grow revenues and drive profits.



Stephen Kelly
*President and Chief
Operating Officer*
Chordiant Software, Inc.

Customer Relationship Management: It's Not Just Software Achieving Intelligent Customer Communications Management

The typical customer service experience has died under the weight of mass consumption and new e-Business distribution channels. Worldwide, the burden of inbound customer service requests threatens to bury companies facing extreme IT demands. In this hostile environment, proper management of each and every customer interaction has never been more critical to survival. Meeting these challenges head-on, many European consumer businesses, such as banks and financial services companies, are leading the way in exceeding customer expectations. In Europe, where CRM is considered a business strategy enrolling the use of an IT architecture to deliver this capability, it is referred to as "Intelligent Customer Communications Management." In his presentation, Kelly will describe this architecture and illustrate its use with real case studies of major European companies with which he has worked.



CITRIX SYSTEMS, INC. is a global leader in application server software and services that offer "Digital Independence" — the ability to run any application on any device over any connection, wireless to Web. Citrix solutions enable organizations of all types, from enterprises to application service providers (ASPs), to reach more users with more applications, and achieve this with greater speed, predictability and cost-effectiveness. Citrix offerings include MetaFrame application server software, NFuse application portal software, Management Services products and Independent Computing Architecture (ICA), a core application server technology. Citrix is headquartered in Fort Lauderdale, FL.

Digital Independence through Application Server Solutions

By overcoming the traditional constraints and complexities of e-business technology, CIOs have the power to reach more users, with more applications, than ever before. By having the ability to run any application on any device with any connection, wireless to Web, CIOs may increase speed of operations with greater predictability and lower costs. As a result, organizations can compete most effectively in today's digital age — a dynamic age of e-business, the Internet and the continual addition and evolution of new applications, devices and services.



E.PIPHANY is a leading provider of intelligent customer interaction software for the Customer Economy. By providing an integrated suite of software solutions, E.piphany E.5 blends web-based analytic and operational CRM to unify all inbound and outbound marketing, sales and customer service interactions. E.piphany E.5 enables a single, enterprise-wide view of each customer to help global businesses better understand and proactively serve customers in real time. With worldwide headquarters in San Mateo, CA, E.piphany has regional operations and offices throughout the U.S., Europe and Asia Pacific.

Bill Walsh
*Executive Vice President and General
Manager, International*
E.piphany

CRM: A Technology without Boundaries

Today's Customer Economy is a global force, and companies with operations around the world are using CRM for competitive advantage. In its own global expansion, E.piphany has uncovered that each global market has a different business requirement, and these different regions are approaching CRM in a variety of ways. In this session you will learn how to globalize your CRM efforts, what the leading customer-centric business requirements in major global markets are, and hear remarkable success stories about leading global companies.



EDS, the leading pure-play global services company, provides strategy, implementation and hosting for clients managing the complexities of the digital economy. We bring together the world's best technologies to address our clients' critical business imperatives. We help clients eliminate boundaries, collaborate in new ways, establish their customers' trust and continuously seek improvement. In fact, everything we do helps enterprises win in the digital economy. We serve the world's leading companies and governments in about 55 countries. Learn more about us at www.eds.com.



Dr. A. Reza Jafari
President of the EDS
Communications,
Entertainment and
Media Global Industry
Group
EDS

Mobility: The Engine that Drives the Digital Economy

For more than a year, we've been hearing about "mobile" communications — the ability to stay connected anytime, anywhere and any way. Yet, amidst the hype and confusing claims, many are missing the opportunity to fully harness the power of mobility. Dr. Reza Jafari will discuss what it takes to succeed in the digital economy through full-fledged mobility. He will cover the value of a viable business value chain and the importance of scope and scale in meeting the needs of businesses and customers alike. Through a discussion of real-life examples, session participants will learn how to achieve digital freedom through a spectrum of capabilities using wireless and wireline transmission — at work, home and play.



HEWLETT-PACKARD COMPANY — a leading global provider of computing and imaging solutions and services — is focused on making technology and its benefits accessible to individuals and businesses through simple appliances, useful e-services and an Internet infrastructure that's always on. HP has 88,500 employees worldwide and had total revenue from continuing operations of \$48.8 billion in its 2000 fiscal year. Information about HP and its products can be found on the World Wide Web at www.hp.com.



Rich Raimondi
Vice President and
General Manager,
E-services.Solutions
Hewlett-Packard
Company

How to Capitalize on E-Services

E-services are the next big Internet wave. Quickly growing in popularity, these services consist of software, computing resources, information, business processes, and any other asset that a company can digitize and deliver over the Internet. Raimondi will discuss how forward-thinking companies are capitalizing on e-services to quickly generate new revenue streams and lower costs. He'll explain how the spread of mobile information appliances is creating a lucrative market for mobile e-services. Raimondi will also consider the role that partner ecosystems play in e-services and will discuss the importance of an always-on infrastructure to deliver those e-services.

Information Builders

INFORMATION BUILDERS helps leading organizations, including 92 of the *Fortune* 100, drive operations and maximize opportunities through the power of information. We provide the only comprehensive business intelligence software solutions with built-in access to any data and the ability to handle all enterprise reporting requirements, including portals, OLAP, ad hoc, and information broadcasting. Our solutions enable organizations to transform themselves to e-businesses more quickly and cost-effectively by integrating core business systems and data, including legacy and ERP, with new technologies such as wireless and XML, for the rapid development of B2B, B2C, CRM, and intranet systems. For more information, visit us at www.informationbuilders.com.

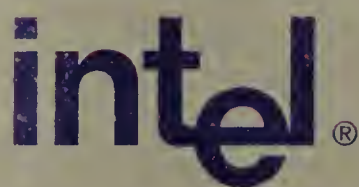


Michael Corcoran
Vice President of
Marketing
Information Builders

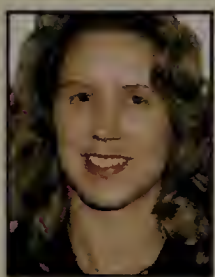
i-Business Intelligence: Today's Strategic Weapon

e-Business is a given. i-Business is the challenge. Most organizations spend billions collecting data, only to use less than 7%. Market leaders will be those that move closest to 100%. The business of the future acts quickly, anticipating change and improving business processes. With i-Business, you can not only automate business processes, you can improve them. How much more intelligent can you make your business processes? How much more insight can you give your managers and employees into the business so they can take effective action? How much more integrated can you make your supply chain and enterprise? How much more interactive can you be with your customers? Hear how leading organizations are dealing with these challenges by providing information to their managers, partners, customers — including mobile users.

corporate hosts and



For over three decades, **INTEL CORPORATION** has developed technology enabling the computer and Internet revolution that has changed the world. Intel is at the forefront as a primary building block supplier for the Internet economy. Today, companies incorporate Intel architecture-based solutions across their connected business and IT environments to create successful e-Business infrastructures: from Internet servers to data center systems, desktops to workstations, and laptops to network PCs and online services. For more information on Intel and its role in e-Business, visit us on the web at www.intel.com/ebusiness.



Carol Lee Cobb
eMarketing Strategist
Intel Corporation

The Critical Challenge of Customer Service

With the Internet driving an increased demand for personalized service, instant information and collaboration, customer service has become a critical challenge in the Internet economy. However, customer service is often not given the same high priority as other mission-critical business issues. But how do you implement a customer-centric e-business solution in this demanding environment? What is possible with today's technologies? We'll explore three real-world case studies that illustrate how e-business companies and customers are implementing customer-centric solutions to solve real business problems today. A proof-of-concept prototype of a customer-centric e-business solution will be shown and distributed to each participant.



INTEL ONLINE SERVICES provides global web services that manage the complexities of e-Business computing. We focus on delivering a better overall customer experience by combining integrated technologies and proven processes to provide services with built-in reliability, scalability and optimal performance. We offer a broad spectrum of services, including managed web hosting, database hosting, application hosting, caching and streaming media, backup and recovery, scalable data storage, and global service delivery and load balancing. Visit www.intelonline.com.

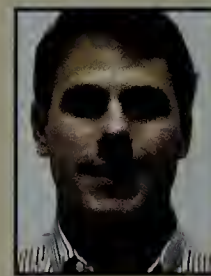
Renee James
World Wide Director of
Marketing and Customer Services
Intel Online Services

An Integrated Approach to Outsourcing e-Business

The Internet is now reaching out to every corner of the planet touching billions of people and businesses, and maturing at an incredibly rapid pace. The Internet's many facets — network infrastructure, ISPs, ASPs, hosting, servers, clients and services—are beginning to move toward specialization as various companies develop areas of core competency in specific service segments. With this development comes new challenges and new opportunities. Intel® Online Services provides global web services that manage the complexities of e-Business computing. We focus on delivering a better overall customer experience by combining integrated technologies and proven processes to provide services with built-in reliability, scalability and optimal performance. By offering outsourced e-Business solutions using best-in-class applications, we fill the void left by the specialization trend in the market.



KINTANA: Powering Business Transformation with Technology Chain Automation. Kintana provides an enterprise application bringing speed and control to business initiatives and technology operations. More than 200 leading companies use Technology Chain Automation from Kintana to automate business and technology processes, gain real-time visibility and control of IT initiatives and leverage their technology investments. The results? In a few weeks, tenfold speed and productivity gains in IT. Please visit www.kintana.com or see us at CIO Perspectives.



Andy Starr
Director of Information
Technology
Cisco
Courtesy of Kintana

Cisco's Approach to Business Transformation; Powering the Cisco Connection Online with Kintana

Ninety percent of Cisco orders are processed through a critical e-commerce application called Cisco Connection Online. It brings together 400 content developers, 700,000 data files, and 175 applications to generate \$55 million in revenue every day. Managing CCO is an enormous challenge. Gaining visibility and control over the site's ongoing initiatives and operations is key to success. Cisco worked with Kintana, creators of technology chain automation, to achieve secure, systemized processes, self-service reviews and approvals, and automated deployment of new site features. This has allowed Cisco to reduce the size of the site's management team by 25 percent, even while revenues through CCO have quadrupled. Starr tells how Cisco transformed one of the world's largest e-commerce sites.



LEGATO SYSTEMS, INC. (NASDAQ: LGTO), is a worldwide leader in enterprise storage management. Helping companies leverage business-critical, corporate data assets, Legato's products and services enable information continuance, a seamless approach to the movement, management and protection of data throughout an enterprise. Founded in 1988, Legato serves *Fortune* 1000 companies and has become the recognized industry standard for storage management software products, currently shipping to 30 of the 50 *Fortune* e-50 top businesses. Legato is a founding member of the Storage Networking Industry Association.



George Symons
Vice President, Product
Development
Legato Systems

Information Availability Requirements for the Enterprise Service Provider

This talk discusses the transition enterprise IT organizations are going through to deliver on service level objectives. These IT organizations are feeling pressure from internal customers to commit to service level objectives in the same way that service providers are beginning to do. In addition, market trends and the challenges of a multiple platform open systems environment and the complexities it brings are discussed. Finally, a set of criteria is presented, including short-term and long-term strategies, along with product functionality so companies can meet service level objectives easier.



NetScout.
Because the network is the business.™

NETSCOUT SYSTEMS, INC. is the leading provider of infrastructure performance management solutions for leading companies and service providers worldwide. Headquartered in Westford, Massachusetts, NetScout serves approximately half of the *Fortune* 500 with offices in North America, Europe and Asia. NetScout's flagship solution is the nGenius™ Performance Management System, a suite of network management software and hardware products that optimize the performance of the network and its ability to deliver applications and content to end-users. For more information on NetScout go to www.netscout.com



Bruce Kelley
Vice President
Engineering
NetScout Systems, Inc.

The Top Five Secrets of Making Your Network Infrastructure Investment Pay

Why is network management suddenly so HOT? With the Internet a widespread means of conducting business, the performance of the network infrastructure is now top of everyone's mind. In fact, recent studies indicate that networking infrastructures now rank among the top expenditures for any leading business. However, the challenge of deriving value from this spending remains huge. How do you maximize the performance of this complex network environment while delivering greater returns on your investment? In this session, Kelley will address the top issues facing CIOs today in managing their e-business networks. He will discuss the pros and cons of instrumenting a network, how to use key business metrics that measure overall performance, and how to tap into valuable network data sources that can lower total cost of ownership.



PROSIGHT combines a suite of IT management applications and services with just-in-time information to enable IT executives to effectively choose and execute an IT investment strategy that increases the value to the businesses they serve. ProSight's software allows IT managers to automate key IT processes such as portfolio management and life cycle management. At the same time, ProSight's applications are communicating critical real-time measures of IT performance and integrating practical knowledge to support timely decisions. All of this puts the CIO and senior IT team in control of the resources under their command. Learn more about ProSight by visiting www.prosight.com.



John Cimral
CEO
ProSight Inc.

Eric Nagel
Senior Vice President,
Domestic Operations
ALLTEL Information
Services

In Search of Ariadne's Thread: How One Information Services Company's Unique Implementation of IT Management Software Enabled Effective Client Health Assessment

Similar to Theseus following the golden thread left by Ariadne to lead him out of the labyrinth, companies today are searching for that "golden thread" to lead them through the labyrinth to effective assessment of their service level to their customers. ALLTEL Information Services (Telecom Division) implemented ProSight's IT Management application to automate IT performance management and enabled them to dynamically assess the "health" of each of their many clients. This ability has allowed ALLTEL to lower the cost of service assessment, proactively respond to "health" issues in a quicker fashion, and provide insight into service dimensions previously unseen.

corporate hosts and



SERVICEWARE is a leading provider of Web-based solutions for enterprise service and support, which enable organizations to win on service in the competitive world of eBusiness. ServiceWare delivers a comprehensive, integrated family of eService solutions that enable organizations to easily provide customers with fast, accurate answers to inquiries via Web, e-mail, phone, fax or in-person. Based on ServiceWare's robust knowledge base and patented Cognitive Processor™, ServiceWare's eService Suite™ enables customers to build service destinations for eBusiness.



Mark Tapling
President & CEO
ServiceWare

The New Definition of Customer Service

As use of the Internet expands, so does customer service delivery. Successful companies must expand their vision of customer service by not only applying intervention to address broken business processes, but by providing customers with the tools they need to be self-sufficient, and facilitate the speed of collaborative business. Concurrently, low switching costs and fleeting customer loyalty require that companies broaden their definition of the "customer" to include everyone that affects their business — employees, partners and shareholders. This presentation offers Tapling as an expert on the changing definition of customer service today while raising the question: what will customer service look like in 2010?



Founded in October 1999, **SITESMITH** is the leading provider of comprehensive Internet infrastructure managed services. The company develops and manages large-scale, complex Internet sites for Global 2000 companies to ensure performance, reliability, security and scalability. Providing a complete and flexible Internet infrastructure solution, SiteSmith Operations Platform automates the critical elements of site management including security, 24x7 monitoring, network redundancy and backup. The company has its U.S. Headquarters in Santa Clara, CA and its European Headquarters in London. Information about SiteSmith's services and world-wide office locations are available on the World Wide Web at www.sitesmith.com



Treb Ryan
Founder
SiteSmith, Inc.

The Promise of Managed Services

Does the management and architecture of your Web site give you a business advantage over your competition? In choosing where to host, what technologies to run and which MSP to handle the delicacies of your site, you are deciding your online fate. Ryan will explore the different offerings in the managed service space, and try to answer some of the questions you're facing: Is a co-location facility equipped to handle the 24x7 management needs of a Global 2000 Web site? Why do the various MSPs bring such differing perspectives about how to architect, manage and scale a site? And, are the co-location providers and MSPs fulfilling the promises they make to their clients? As we explore these questions, it will become evident that the promise of monitoring, high availability, site architecture, an operating platform, security and backup can have vastly different connotations — and a real impact on business advantage.



TRIPWIRE, INC. is the leading provider of data and network integrity solutions for Global 3000 companies and e-business corporations as well as key public sector organizations. Tripwire enterprise software provides the foundation upon which security, network management and risk management strategies are built. It ensures that organizations can be confident in the integrity of all "data at rest" in their network (source, destination, and all stops in between.) Tripwire customers include Intuit, AT&T, Ernst & Young and the U.S. House of Representatives. Tripwire is headquartered in Portland, Oregon with offices in Silicon Valley, CA, and 15 countries around the world. For more information about Tripwire, please visit our Web site at www.tripwire.com.



Charles Kolodgy
Research Manager
International Data
Corporation (IDC):
Internet Security
Program

Prashant Dubey
Vice President
Marketing & Business Development
Tripwire, Inc.

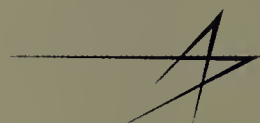
How CIOs Can Invoke Trust in IT: Data and Network Integrity

Cyber terrorism and hacker attacks have been a subject of media hype, and grand IT compromises have been highlighted for all in the industry to see. An IT infrastructure that does not have integrity can result in economic loss or even loss of market perception that can be a "bet the company" situation. In this session Kolodgy will describe the "state of the state" of Information Security and talk about progress made, challenges ahead and CIO strategies to overcome them. In addition he will discuss the concept of Data and Network Integrity (DNI) and how it is a foundation for an information security, network management and risk management strategy.

*The following Corporate Hosts
will also be joining CIO in Boca Raton.*



INTIRA CORPORATION is a leading e-business infrastructure outsourcing provider. Intira Netsourcing Solutions power mission-critical e-business applications with maximum availability by providing a seamlessly integrated IT/network infrastructure; highly automated, secure operations; a broad set of highly skilled technical resources; and a full range of robust, value-added services. Intira Netsourcing Solutions enable e-businesses to remain focused on their core business competencies — not the complex technology running their e-business applications. Visit Intira at www.intira.com.

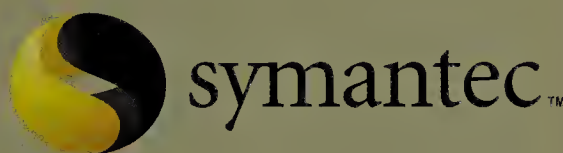


LOCKHEED MARTIN

LOCKHEED MARTIN Global Telecommunications is a premier global source of network services and advanced infocom solutions to enterprise customers. A wholly owned subsidiary of the Corporation, LMGIT is focused on offering one-stop solutions for integrated, managed, secure, Web-based enterprise IT and telecommunications services via a broad portfolio of network, application and IT services.



KYOCERA MITA AMERICA, INC., is a leader in digital document imaging. As part of the \$7.5 billion Kyocera Corporation, KMA is known for developing economical, ecologically sound print engines, state of the art controllers and network tools plus years of innovation in copier technologies, paper handling and manufacturing experience. The product line includes network ready computer connectable digital printers, printer/copiers, color printer/copiers, multifunctional and wide format imaging solutions. For more information, visit www.kyoceramita.com.



SYMANTEC, a world leader in Internet security technology, provides a broad range of content and network security solutions to individuals and enterprises. The company is a leading provider of virus protection, risk management, Internet content and e-mail filtering, remote management and mobile code detection technologies. Headquartered in Cupertino, CA, Symantec has worldwide operations in more than 33 countries.

Companion Program

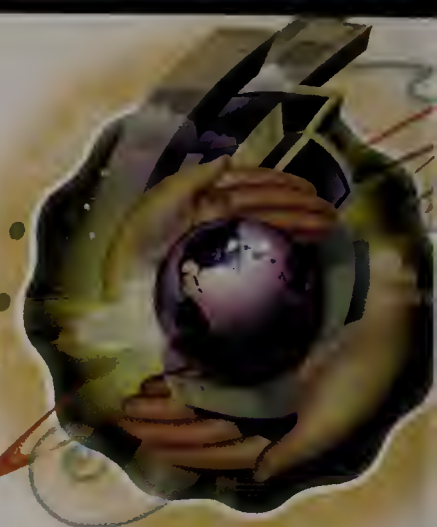
The companion program allows companions to join conference participants during designated meals and social activities at the **CIO Perspectives** conference and meet other companions for special activities. Plan your vacation with us in sunny Florida and enjoy brunch on the beach, a unique fitness class, and a complimentary shopping shuttle to exciting Mizner Park. Can you picture yourself as a culinary whiz? Participate in a special lunch that is hands on and led by one of Boca Raton Resort & Club's award winning chefs. If you can find any time left over from planned activities, visit the resort's luxurious health and fitness center where you can enjoy a relaxing spa treatment or indulge in one of the many watersports offered.





Without Boundaries:

THE CIO IN THE NEW WORLD



APRIL 22 - 24, 2001

BOCA RATON RESORT & CLUB

BOCA RATON, FLORIDA

☐ I won't be able to attend, but please keep me updated on future CIO events.

NAME

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COMPANY

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MAIL STOP

CITY

STATE

ZIP CODE

PHONE

FAX

E-MAIL

COMPANY WEB SITE ADDRESS

WHAT IS YOUR INDUSTRY?

WHAT ARE YOUR ORGANIZATION'S ANNUAL REVENUES OR ASSETS?

WHAT IS YOUR ANNUAL IT BUDGET?

YOUR NAME AS YOU WANT IT TO APPEAR ON YOUR BADGE

NAME OF COMPANION (IF PARTICIPATING IN COMPANION PROGRAM)

HOTEL ACCOMMODATIONS

We urge you to make your reservations early by calling the hotel at 561-447-3000 and identifying yourself as part of the CIO conference to receive the conference rate. **CIO will make hotel reservations for government/military participants only.** Be sure to guarantee your room with a credit card, as all unreserved or unguaranteed rooms will be released on March 23, 2001. Hotel reservations, cancellations and charges are your responsibility. If a CIO conference Enrollment Form is not received within 48 hours of making your hotel reservation, your room will be released from the CIO room block.

ENROLLMENT FEES

All enrollment fees must be paid in advance of the meeting. Fee includes conference sessions, business briefings, Corporate Host displays, conference materials and scheduled meals, receptions and entertainment. Transportation, hotel and recreation are your responsibility. **Please note that submission of this enrollment form to CIO obligates the attendee/sender for the enrollment fee.**

CANCELLATION

All cancellations or substitutions must be made in writing. You may cancel your conference or companion enrollment up to March 23, 2001 without penalty. A \$300 administration fee will be imposed for cancellations between March 24 - April 6, 2001. **No refund or credit will be given for cancellations after April 6, 2001 or for no shows.** You may send a substitute in your place. CIO reserves the right to decline enrollment to any registrant.

If this is your first CIO conference, your business card is required to process your registration.

CHECK ALL THAT APPLY:

ENROLLMENT FEES:

☐ **IT PRACTITIONER/EXECUTIVE = \$2,480**

This fee applies if you are a CIO, IS executive or hold another executive position other than those listed below.

☐ **GOVERNMENT/MILITARY = \$2,900**

This fee includes your hotel for three nights. Do not make your hotel reservations, CIO will make them for you.

Arrival Date _____ Departure date _____

☐ **SALES/MARKETING/CONSULTING = \$10,000**

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COMPANIES TO WATCH

Silanis Technology

Sign Online

Silanis Technology is set on capturing the reenergized electronic signature technology market BY J. BROWN

WHEN FORMER PRESIDENT CLINTON signed the Electronic Signatures in Global and National Commerce (E-Sign) Act into law on Oct. 1, 2000, it signaled a significant change for businesses of many types—especially those involved in e-commerce. Suddenly, companies could complete important business transactions with the assurance that electronically signed agreements would be considered as legally valid as hand-signed, printed documents.

One company poised to take advantage of this law is Silanis Technology. It has been producing electronic signature software since 1992. A combination of experience in the marketplace and unique technology that allows for multisignature and multistage approval makes Silanis a significant player. "The [E-Sign] law gives them a huge new space to play in," says

Louis Boyle, a vice president for the Meta Group in Stamford, Conn.

Silanis developed ApproveIt, one of the industry's first multisignature electronic approval management software applications. According to the company, more than 800 organizations currently use Silanis products in government, business, insurance, finance, health-care and pharmaceutical sectors, including the U.S. Joint Chiefs of Staff, Nationwide Mutual Insurance and General Motors Acceptance Corp. In 2000, Silanis created OnSign.com, a consumer division that offers free, downloadable consumer software to meet the legal requirements for secure electronic signing.

Silanis has also recently managed to secure some significant partnerships that may help solidify its place in the market. The U.S. Army Medical Command stan-

dardized on Silanis to enable its 40,000 employees to electronically sign thousands of government documents. The deal represents the single largest deployment for e-signing documents to date.

In addition, Synaptics, a leading supplier of touch-sensing technology to major notebook manufacturers including ACER America, Apple, Compaq, Dell, Gateway and Hewlett-Packard, bundled an OEM version of ApproveIt with its latest offerings.

While it's still too early to predict which companies will come out on top in the race to provide electronic signature software to the thousands of companies expected to use it, Silanis definitely has some advantages. "It has its act together in terms of management structure and a strategic plan," says Boyle. "Its products are also relatively easy to use and easy to distribute."

However, as the market accelerates following the law's passage, Silanis will have challenges to overcome if it intends to stay in front. For example, much of the company's success will depend on whether businesses find ApproveIt capable of meeting all their electronic signature software needs—after they decide what those needs really are. "It's important to separate the attributes which digital signature makes possible: identification of the signer, message integrity and nonrepudiation," says Victor S. Wheatman, information security strategies analyst for Gartner in San Jose, Calif. "Implementing digital signature must be balanced against the perceived risks and the benefits of these attributes."

Branding and market awareness will also be concerns, according to Boyle. "The space they play in is still not well-known. Silanis must now capitalize on the attention given to this market to educate the end user as to the merits of electronic signature technology." **CIO**

Do you know about a small company that deserves the attention of other IT executives? Send suggestions to us at et@cio.com.

watching...

Silanis Technology

Headquarters Montreal and Washington, D.C. ■ **Employees** 65

■ **Products** ApproveIt (for the corporate market) and OnSign (for the home and small-office user) ■

■ **Reason to watch** Unique electronic signature software allows for multisignature and multistage approval ■ **Hurdles to clear** Electronic signature technology is still unfamiliar to many. Branding and awareness will need improving as this marketplace grows.



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lifescience

WORK, PLAY AND OTHER STUFF

EDITED BY SARA SHAY AND LAKE LOW



We've Got to Start Meeting Like This

Make them quick, organized and to the point, and people won't even mind that guy who hums under his breath **BY JEFFREY L. SEGLIN**

"PEOPLE COMPLAIN ALL THE TIME that they spend half their time at meetings and they don't get much done," says Frances A. Micale, CEO of Micale Training Corp. in Atlanta. For people who spend part of their workweek closeted in meetings, such observations ring all too true. It doesn't have to be that way. From those who collectively have run enough meetings to make most of us shudder, here are some tactics to keep in mind.

Know your objective. Be clear what you want the meeting to accomplish. Then share that goal with the meeting attendees before or at the beginning of the meeting.

Develop an agenda. "Your agenda is going to get you to your objective," says Micale. On the agenda, identify the meeting topic, the start and finish time, the attendees, the presenters and their topics, as well as the time allotted for each agenda item.

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*Mark Tonnesen, Vice President Information Technology
Cisco Systems*



Invite the right people. Too often, says Micale, “people are drawn away from their jobs without the slightest thought of whether they need to be there. You end up inconveniencing them, having them resent the fact that they don’t know why they are there and costing the organization their salary.”

Start on time. When Alan Goldsworthy started as CEO of Applix, a provider of customer analytics and business planning (such as CRM) based in Westboro, Mass., he started fining employees \$1 for every minute they were late to a meeting. “People are much more mindful that a meeting has to start on time,” says Goldsworthy. He starts his meetings on time regardless of stragglers.

Facilitators should never be late, says Eli Mina, a Vancouver, Canada-based professional meeting facilitator. “If they’re late, it gives everyone else license to be late.”

Use a skilled facilitator. Jamie Walters, president of San Francisco-based InnoVision Communication, a company that advises businesses on internal communications, suggests that the facilitator be “someone who can keep participants focused on the agenda items and navigate prickly interpersonal issues so that the meeting is effective instead of dysfunctional.” The facilitator should also ensure that the meeting isn’t dominated by one or two people. Micale advises against the boss as facilitator so that attendees won’t be inclined to say what they think the boss wants to hear, even if it is the boss’s meeting.

Have tools available. To avoid “last-minute scrambling,” Emma Pearson-Stoner, a vice president at Miller Shandwick Technologies public relations agency in Boston, makes sure before meeting time that equipment that might be needed—projectors, white boards, pens, notepads, markers and so on—is available.

Be aware of physical comforts. Don’t serve sleep-inducing heavy meals or alcohol during a meeting, says Mina. Judy Taylor,

CEO of Taylor’d Communications in St. Louis, suggests that you make sure there are no auditory and visual distractions, more than 90 minutes don’t pass without a stretch or break, the room doesn’t get too warm and the lighting isn’t too dull.

Outlaw cell phones. “When you’re talking to someone and all of a sudden his cell phone goes off and he answers it, he’s just told you that whatever you’re talking about is less important than that phone call,” says Goldsworthy.

Conclude with an action plan. At the end of the meeting, the leader should summarize what’s been discussed, advises Sue Pistone, CEO of Sue Pistone & Associates, a time-management consultancy in Houston. Then decide who is responsible for whatever follow-up is needed, and set target dates for completion.

“The worst meetings I’ve seen,” says Walters, are those where “there isn’t a good reason for the meeting, there’s a poor agenda or none at all, the meeting creeps its way into a several-hour ordeal, participants are unprepared and there’s no skilled facilitation. The result? Wasted time and deflated energy for the participants, not to mention a culture of meeting dread! Good meetings are more rare, but you know when you’re attending one. The purpose is clear, participants are prepared, conversation is dynamic and it ends promptly, with next steps defined.”

We don’t need to meet to agree with those conclusions.

Jeffrey L. Seglin (jseglin@post.harvard.edu) is the author of *The Good, the Bad, and Your Business: Choosing Right When Ethical Dilemmas Pull You Apart* (Wiley, 2000). He teaches at Emerson College in Boston.

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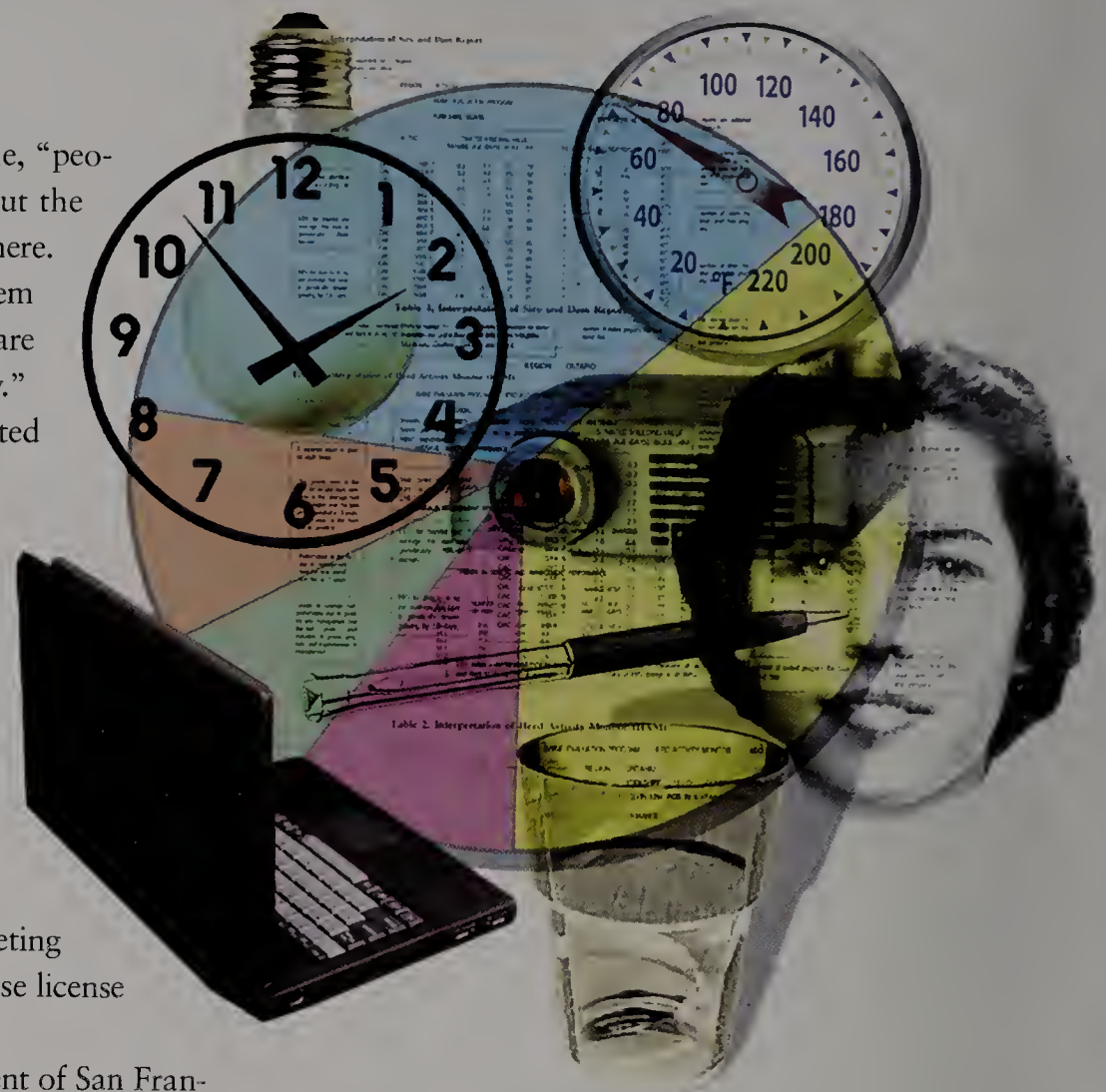
For more ideas on running effective meetings, consider these two guides:

Not Another Meeting! A Practical Guide for Facilitating Effective Meetings

by Frances A. Micale (Oasis Press, 1999, \$17.95).

The Complete Handbook of Business Meetings

by Eli Mina (Amacom, 2000, \$29.95).



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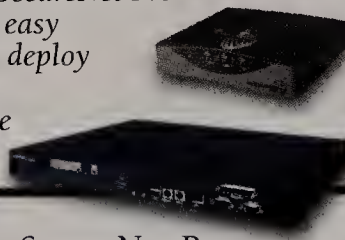
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Atlanta: Olympic Proportions

Atlanta is well on its way to becoming the convention and culinary capital of the South **BY WILLIAM SCHEMME**

Getting your bearings in this rapidly changing metropolis can be difficult. The street pattern is an oxymoron. The map looks like a plate of spilled linguini; streets capriciously change their names. Nevertheless, Atlanta, urbane and cosmopolitan, is still small-town enough to be hospitable.

(Numbers listed are within 404 area code unless otherwise indicated.)

airport Hartsfield Atlanta

International Airport, 10 miles south of downtown, is one of the world's busiest. **MARTA** (Metropolitan Atlanta Rapid Transit Authority) trains (848-4711) can get you to downtown Atlanta or the Buckhead district in about 15 minutes (\$1.75 one-way). Rental cars, taxis and shuttle vans are also available.

hotels The 470-room **Omni Hotel** at CNN Center (659-0000; \$159-\$775) is just a few

steps from the **Georgia World Congress Center**, Georgia Dome and Centennial Olympic Park. In the nearby Peachtree Center office building cluster, **The Ritz-Carlton Atlanta**, Downtown (659-0400; \$225-\$395); **Atlanta Hilton & Towers** (659-2000; \$199-\$1,500); **Westin Peachtree Plaza** (659-1400; \$235-\$890) and **Atlanta Marriott Marquis** (521-0000; \$209-\$500) also house conventioners and tourists in cushy comfort. The **Ritz-Carlton Buckhead** (237-2700; \$255-\$1,500); **Swissôtel** (365-0065; \$225-\$355) and **Grand Hyatt Atlanta** (365-8100; \$230-\$2,500) are top-drawer choices in the Buckhead corporate and financial district.

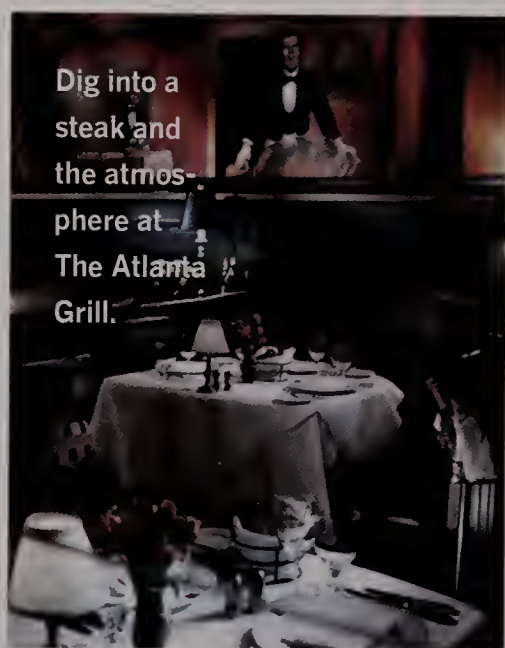
restaurants Local dining gurus give gold stars to **Bacchanalia's** new American cuisine (365-0410), **Antica Posta's** Tuscan pasta (262-7112), **Brasserie Le Coze's** flawless French Provençal cooking

(266-1440) and **Seeger's** award-winning European cuisine (846-9779). For clubby steaks and seafood, reserve a table at the downtown **Ritz-Carlton's Atlanta Grill** (659-0400), **Bone's** (237-2663) or **Chops** (262-2675) in Buckhead. For fried chicken and Southern comfort trimmings, Atlantans fill up at **The Colonnade** (874-5642). Asian and Latino foodies can pick from miles of authentic eateries on Buford Highway's "Chambodia" strip.

family fun Kids (and lots of adults) love to splash in **Centennial Olympic Park's** Fountain of Rings. **SciTreK Museum** (522-5500) keeps idle hands busy with 150 gadgets to push, pull, climb into and stand on. Work off excess energy at **Galyan's** athletic gear store (267-0200) on a 60-foot indoor climbing wall, or at **Stone**

Mountain Park (16 miles east of downtown, 770 498-5600), where you can climb the world's largest granite monolith (830 feet high and 5 miles around).

CIO-friendly bars/clubs At the end of the day, Buckhead execs unwind at **The Palm** in the Swissôtel (814-1955), **The Ritz-Carlton Buckhead** hotel bar (237-2700) or the cozy **Beluga Martini Bar** in Buckhead (869-1090). Downtown counterparts like the offbeat aura of **Mumbo Jumbo**



Dig into a steak and the atmosphere at The Atlanta Grill.



PHOTO LEFT COURTESY OF THE RITZ-CARLTON; PHOTOS TOP AND RIGHT BY TONY STONE



The High Museum of Art blends forms and cultures.

(523-0330) and **Max Lager's American Grill and Brewery** (525-4400). **Eno** (685-3191) stocks one of the city's best wine bars.

insider's guide Join Atlantans for a night of dining, browsing and pub-crawling in the neighborhood around North Highland and Virginia Avenues (Vi-High). Three miles from downtown, this stretch is packed with lively restaurants, bars and offbeat shops. **Limerick Junction Pub** (874-7147) celebrates the Emerald Isle with rollicking music. **Surin of Thailand** (892-7789), **Noche** for southwestern cuisine (815-9155), **Mambo Restaurante Cubano** (876-2626) and **Fontaine's Oysterhouse** (872-0869) are Vi-High regulars' favorite eateries.

museums/theater/music Catch a concert or musical at **The Fox Theatre**, a beautifully restored late 1920s palace with minarets, hieroglyphics and a ceiling twinkling with electric stars (881-2100). **The High Museum of Art** (733-4444) complements the permanent American, European, decorative arts, Southern folk art and African collections with touring shows.

calendar The Atlanta Hawks (827-3800) and Atlanta Thrashers (584-7825) wind up their seasons at **Philips Arena** (827-2300), next to the Georgia World Congress Center. The Atlanta Braves begin another National League pennant chase in early April at **Turner Field**, south of downtown (522-7630).

CIO'S CORNER:

"**Chops**, an upscale steak and seafood restaurant in Buckhead, is one of my favorite places to entertain clients," says **Michael Crawford**, national sales director and head of IT for Primerica, an Atlanta-based national insurance and financial services corporation. "The food, service and atmosphere always make a great impression. We also enjoy **The Lobster Bar**, downstairs from Chops. Both restaurants are part of the Buckhead Life Restaurant Group, which also owns Pano's and Paul's, 103 West and other excellent restaurants. For drinks and jazz, we frequently take clients to **Carbo's Café**, a restaurant and lounge in the Buckhead, with great food, drinks and music." Crawford entertains nearly as many guests over the links as he does over dinner and drinks. "With Atlanta's terrific year-round weather, we also do a lot of client business over golf."

weather March comes in cool, windy and rainy. Bring a topcoat and sweater, just to be safe.

Average high temperature: 64°F

Average low temperature: 43°F

Average precipitation: 5.6 inches

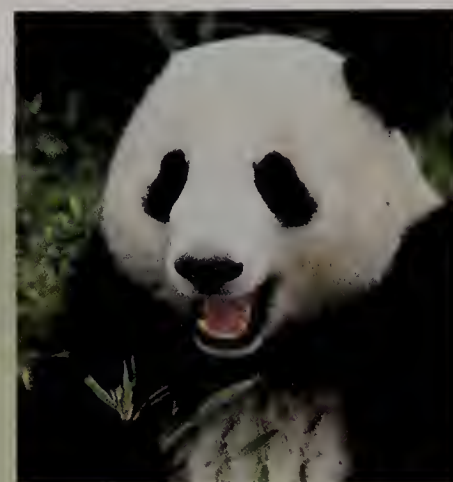
other resources **Crawford Long Hospital** of Emory University (686-4411) is near downtown hotels. **Piedmont Hospital** (605-5000) is between downtown and Buckhead. **CVS** (881-0329 and 351-7629) has 24-hour pharmacies. Contact the **Atlanta Convention and Visitors Bureau** (521-6600, acvb.com) for additional local information.

rent or buy Kinko's three downtown locations include one close to the Peachtree Center hotel district (221-0000). **SST Computing** (770 426-0051) and **Electro Rent** (800 688-1111) will deliver computers and scanners to your hotel. Need dry-cleaning quick? **Custom Cleaners & Alterations** (876-2321) and **Fashion Care** (522-0191) are near downtown hotels.

William Schemmel is a travel writer based in the Atlanta area.

don't miss

Lun-Lun and Yang-Yang, two beautiful giant Chinese pandas who eat bamboo and sleep a lot while crowds of humans ooh and aah around their cushy habitat at Zoo Atlanta in Grant Park (624-5600). Silverback mountain gorillas and orangutans are some of the other star attractions.

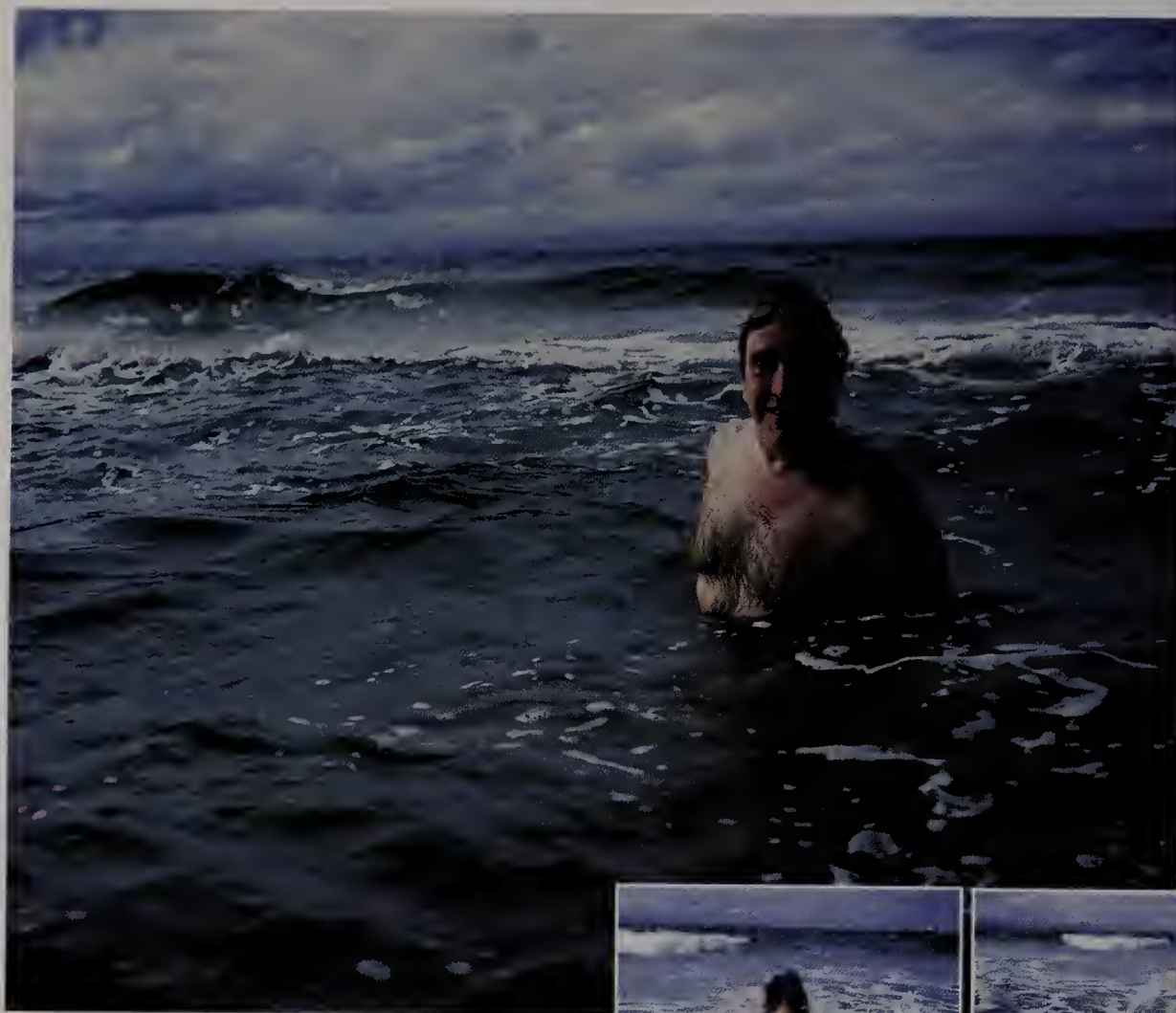


real world

The Aquaman Cometh

While you were busy outsourcing e-commerce, this CIO was conquering the English Channel

BY MERIDITH LEVINSON



"IT WAS SPIRITUALLY AWAKENING for me," says Henry Eckstein, vice president and CIO at York Claims Service, a New York City-based insurance claims provider, of his first experience swimming across the English Channel. "It made me aware that so much of what I do in life begins with the desire and the thought. Thinking is the basis of action, and action is the basis of your success," says the soft-spoken 53-year-old.

Last summer, Eckstein plowed through swelling, white-capped waves, surged through 18-mile-per-hour winds, passed super-tankers, battled jellyfish, staved off hypothermia and ate 24 times on his way from England's White Cliffs of Dover to France's Cap Griz Nez. He crossed the channel in 14 hours and 24 minutes, covering a

total distance of between 30 and 35 miles. (The actual distance across the channel is 22 miles, but the strong current prevents swimmers from cutting directly across.)

On the morning of Aug. 24, Eckstein's boat captain and swim team partner, Michael Ross, who inspired the Piscean CIO to start long-distance swims, estimated he could cross it in 12 to 14 hours. Eckstein resolved to traverse it in 12.

"After six hours I thought, 'Oh great, I'm halfway there,'" says Eckstein, who swam wearing a watch along with his goggles, bathing cap and Speedo. "After nine hours I thought, 'I'm three-quarters of the way there.'

At 12 hours, I found myself on the crest of a wave and I caught sight of the coast of France. It was far away. I said to myself, 'I have a little less than two morning workouts.'"

After 12 hours of his arms and legs pummeling the 62-degree water, exhaustion set in. Eckstein shouted through the waves to his crew, "Give me some encouragement!" They shouted back to him, "Keep swimming!" He also needed food. He had been consuming a sports drink called Endurox, which his crew mixed with hot water and tossed over the side of the boat for him at regular intervals during the swim.

Eckstein says his boat captain wouldn't let the crew feed him during the final hour of the swim. If he had taken that last draught of Endurox, he might not have stormed the beach at Cap Griz Nez. "If you stop," he



says, "the current will throw the navigation off. The current is so strong that it carries you against the direction you want to swim. The 30 seconds it takes to feed is the difference between landing on the beach or having the current sweep you back out and having to swim for another six hours." **CIO**

Senior Writer Meridith Levinson is quite a swimmer as well. Tell her your stories at mlevinson@cio.com.

Suggest future topics, and let us know what you think about Life Science. E-mail us at lifescience@cio.com.

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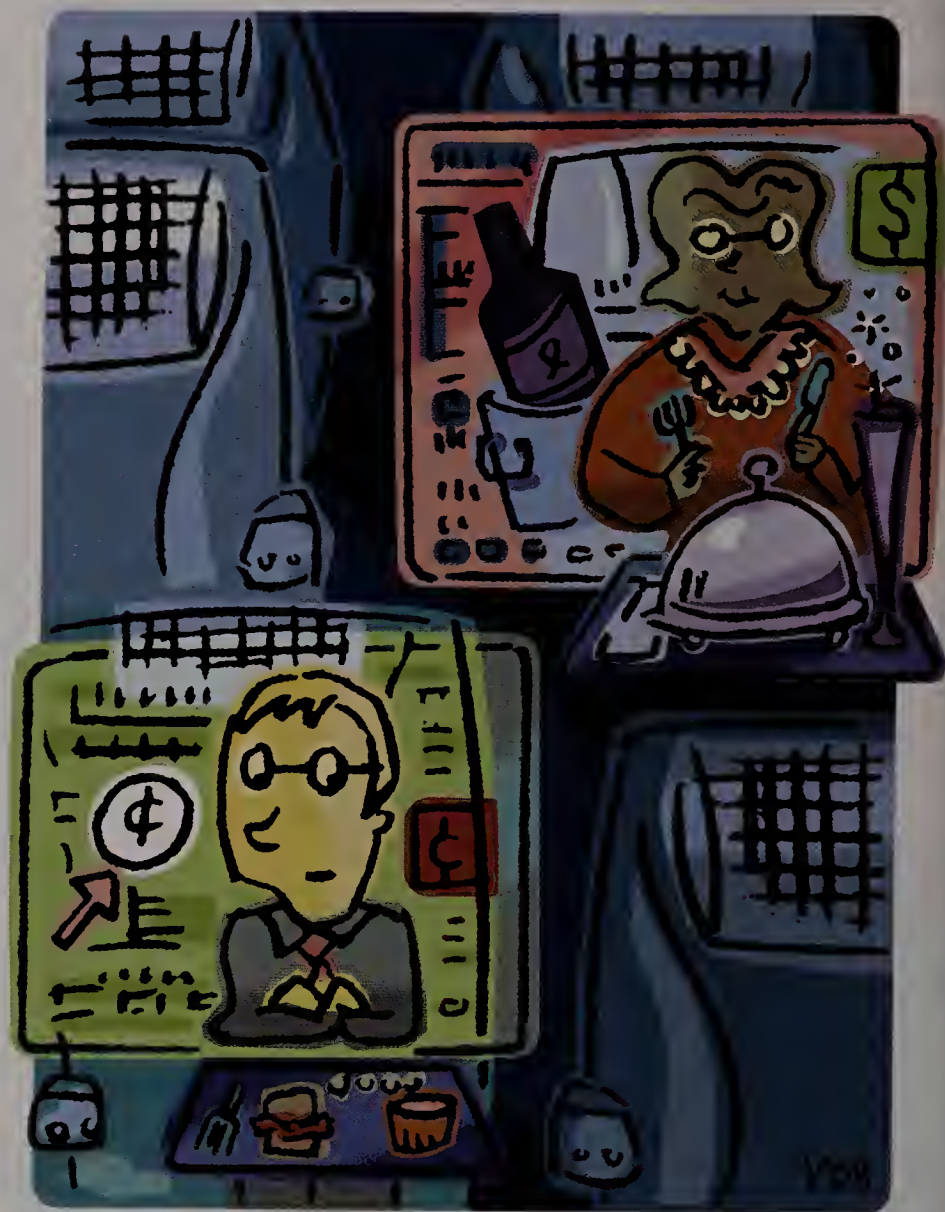
The Social Impact of Technology

Welcome to Second Class

Much like airlines already do, Web merchants may soon use personalized information to provide different levels of service and price

BY JONATHAN ZITTRAIN

I PREBOARDED A FLIGHT from Boston to Los Angeles as soon as the jet-way door opened—one of the several useful perks of first class. Soon the rest of the gentry settled in around me. As we pushed back from the gate, a flight attendant stopped at my row. “Mister, uh, Barker?” she said, awkwardly consulting a computer printout attached sideways to a clipboard. The man next to me nodded. She leaned conspiratorially close to him, and said, “Just so we don’t run out of something you want, I’ll take your dinner order now.” He went with the chateaubriand and she vanished. Having been deprived of a slightly-better-than-leather steak on earlier flights, thanks to the vicissitudes of seat placement even in the first-class cabin, I



stewed anew. Is the airline food selection lottery now loaded? Did she somehow know that I earned my front cabin seat thanks only to a frequent-flier upgrade, while Mr. Barker paid full price? Should I care, especially since those in coach weren’t even allowed a ticket to the decent food lottery up here?

Where the airlines are going the Internet will follow, and with it may ultimately go most of our daily transactions.

Here’s what’s happening. First, as we all know, merchants are

ILLUSTRATION BY JOE VANDERBOS

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learning lots about us as we surf the Net. We willingly part with personal information as we fill out order forms and delivery addresses for CDs or groceries, and, of course, our ZIP codes say a lot more about us than just where to find us. In addition to the stuff we type, there are the now-classic mouse droppings: How long do we linger on a page, in microseconds, before we click "buy"? What are we apparently shopping for but not yet ready to buy? These sorts of questions can be answered by our very surfing, rather than by anything we explicitly seek to tell an online vendor. And yes, thanks to cookies (or, increasingly, the tracking of IP addresses assigned to individual computers), websites can recognize us as people who have visited and developed a profile before.

How long before stores start using personalized information to determine whom to rush to on the sales floor and whom to ignore?

This sort of data collection has those sensitive to privacy up in arms, but the nightmares they describe are usually quite tame. Most revolve around a distaste for junk mail. With a good sense of my preferences, merchants can push advertisements at me that I'm more likely to respond to, and information vendors can tailor my news to accord with my projected interests. (See Andrew L. Shapiro's insightful lament over personalization, "Too Close for Comfort," in the Aug. 1, 2000, issue of *CIO*.) Still, *this* is privacy Armageddon?

Soaking the Rich

I suggest a separate vision, one that may be more disturbing to most of us. It involves merchants' use of our personal information to provide differential levels of service, or even differential prices, to different people for the same product or service. Airlines already sell their tickets to us by name, and they're not transferable. Thus, they can offer tickets for adjoining seats on the same flight at an array of prices, making educated guesses about what a particular customer is willing to pay. Last-minute business travelers are a lot less price sensitive than students willing to be flexible about dates and times, and the respective prices reflect that. In a latter-day version of Robin Hood's redistributive crusades, executives on expense accounts are now soaked to subsidize the travel of a sophomore on spring break.

But the airlines' presumptions about the thickness of our wallets pale in comparison to the wealth of data available on the Web. Suppose Amazon.com quoted you a different price for a book than to your next-door neighbor? Indeed, imagine that

everything on the Web were priced with just you in mind. Buying a week's worth of groceries can suddenly involve as much price variation as buying a car, a project in which a talented salesperson can extract several thousand dollars more from the rich (or foolish) than from the poor (or frugal). What coupons only roughly hinted at (those who don't bother to clip them pay more for the same products as those who do), the Web may force outright.

Of course, as long as customers can shop for a better price elsewhere, it will be difficult for merchants to soak not just the rich and lazy, but also the rich and frugal. Yet that may change: Even as the Web has made it easy to jump from one site to the next to compare prices, some merchants are trying to prevent

so-called meta sites like MySimon.com or Pricescan.com from assembling comprehensive rosters of prices to allow for ready comparison. (Indeed, they're claiming that the meta sites' robots are engaged in cybertrespass as they gather pricing information.)

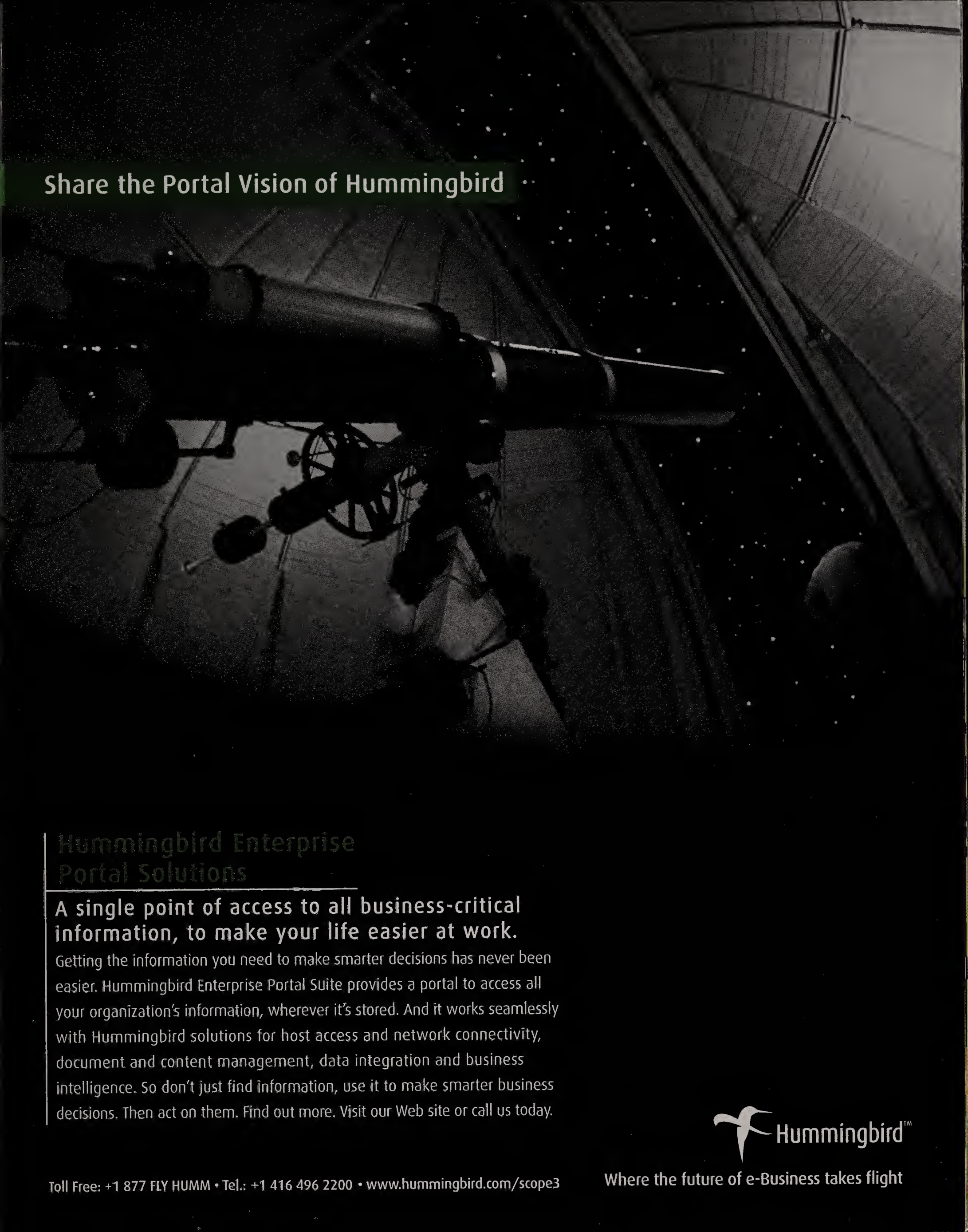
Price isn't the only variable at work.

There's service too. Banks have long kept notations on customers' records, grading them from, say, A to C on the basis of how much they're worth to the bank. If a C demands specialized attention from an associate, she may have to wait just a bit longer than an A and be turned down on a request that would have been granted instantly to a B.

How long before brick-and-mortar stores start using their frequent-shopper cards and accounts to determine whom to rush to on the sales floor and whom to politely ignore? This happens often enough, when the well-dressed shopper is distinguished from the scruffier one, and many are not offended at the merchant's behavior. But at some point a difference in degree can become a difference in kind, and we will find ourselves in a world in which we are instantly and pervasively graded, and treated in accordance with our finely grained economic rank. A Home Depot, online or off, can become as picky as the bouncer outside a Beverly Hills nightclub where velvet ropes lift and fall like a round of London Bridge.

Economists debate whether price discrimination, and its companion, service discrimination, are good things. Airline executives can make a persuasive case that without it there would be far fewer people who could avail themselves of a flight as prices converged to some sort of average.

To be sure, the ability to click comparatively from one site to another on the Web might keep prices down for everyone. Jumping from Amazon.com to Barnesandnoble.com is easier than clipping a coupon. But some customers really are worse than others; they return products more frequently or buy only the underpriced "loss leader" items, failing to return for the



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Where the future of e-Business takes flight

other goods in the store for which the loss leaders were intended as bait. This is a long-acknowledged drawback for business, but rarely has it been punished, until now. Anecdotal accounts—derived from the transactions of a student research assistant who is as frugal as he is sharp—suggest that at least one pop-

The solution may lie in a new sort of public accommodation doctrine, through which consumers could expect roughly equal treatment when purchasing the same products or services. Alternatively, a set of full disclosure rules could require companies to disclose the range of prices for which a given prod-

uct or service is offered and why, not unlike the requirement by which food manufacturers must list the ingredients on packages. At the very least, attempts to build architectures that allow ready price comparison—like Bidder's Edge or Pricescan.com—should not be pre-

cluded through legal maneuvers.

We are in new territory here, and we'd better think hard and harmonize expectations early on. If we don't, we could pay a hefty price—both literally and figuratively—later on. **CIO**

At least one popular Web merchant has refused to deal with people deemed unprofitable.

ular Web merchant has begun to refuse to deal with people deemed unprofitable. Their order requests are denied, even when accompanied with a valid credit card number.

As we hurtle toward a caste system in which each of us stands to be judged and treated in accordance with our tabulated station, we should consider: Is it the mere existence of a grocery store's long line that annoys us, or the fact that another line moves faster than ours? Should we tolerate the kind of thing that is already happening to us in the air as we sort ourselves among economy, business and first?

Do you see us heading toward economic discrimination? Let us know at difference@cio.com. Jonathan Zittrain is assistant professor of law and codirector of the Berkman Center for Internet & Society at Harvard Law School. His e-mail address is zittrain@law.harvard.edu.



Coming in CIO

Look for These Articles in Future Issues

Managing Remote IT Workers

Many IT employees work remotely, and often a company's ability to offer this option is key to recruitment and retention. But how can CIOs effectively motivate, evaluate and otherwise manage these workers when daily personal interaction isn't part of the scenario? Learn from the experiences of managers and remote workers who are dealing with this issue.

Asset Management

A CIO who applies good asset management techniques using IT tools

and services could affect practices throughout the company, not just in the IT department. There's a lot of old techno-junk out there and the piles are growing—and more laws and regulations are dictating that people dispose of this stuff responsibly. Know what you have, whether it's worth keeping, and how to get rid of it safely and legally.

10 Steps to Punditry

Gurus are everywhere—from business magazines and the boardrooms, pundits are sharing their wisdom and charging thousands of dollars in speaking fees. They spend their days writing books and talking about the new economy, broadband and the future. How

do they do it? Better yet, how can you? CIO offers 10 easy steps that will make you a successful source of management enlightenment.

Letting Go

You've learned how to recruit and retain IT workers, but how do you fire them? Experts say that knowing how to fire people correctly is a skill few IT leaders display or bother to cultivate. Do it the right way and people leave your organization sad but not enraged. Screw it up and you run the risks of burning bridges, alienating those who stay and hampering your ability to make future hires. CIO will help you learn to cope with the personal stress of letting people go and identify what it takes to fire someone with dignity.

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A Cold Look at Hot Trends

Looking for Mr. Good Tile

Why don't marketplaces that traffic in service work?
Uh...can we get back to you on that?

BY MEGAN SANTOSUS

A LOT OF DOTCOMS are in the business of bringing buyers and sellers together. These electronic marketplaces promise to ease the lives of both parties by facilitating and streamlining the processes of introduction and transaction.

Generally, electronic marketplaces work well when the things being bought and sold are tangible. Looking to off-load *I Dream of Genie* memorabilia or artwork of questionable lineage? In the market for assorted geegaws, gimcracks and whatchamacallits? Then eBay and the like are where you want to be. But this happy marketplace model falls flat when the items in question are services. The reason for that is that most marketplaces that proffer services today don't have to compete for customers. In this overdrive economy, it's a seller's market. And instead of making a buyer's life easier, electronic marketplaces that deal in services often have the opposite effect; they're clunky, time-consuming and frustrating.

Of course, I discovered this unpleasant truth about service marketplaces the hard way. For example, no other category of enterprise is as ripe for Internet streamlining as is the home improvement industry. Try finding a good plumber. (Good



meaning one who returns your phone call within a month and actually shows up during the eight-hour window as promised.) Go ahead, try. Unless you've got an in-law in the business who owes you a favor, chances are you won't get anyone to even bid on a job within six months.

No Help Wanted

When I settled into my new home, I listed 10 projects I wanted to complete before paying off my 15-year second mortgage. After six months of living amid stacked boxes, bare walls and a naked yard, I've managed to get exactly zero projects started, to say nothing of contracted. So I turned to a couple of home improvement websites promising quick responses and accurate estimates from reliable, prescreened contractors licensed to work right in my neighborhood.

I logged on to one site and spent about 15 minutes filling out

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four screens of information. I described the tiling I wanted done in my kitchen, complete with a rough estimate of the linear feet involved and what I was willing to pay. I fessed up in that I would go higher for anyone who would schedule the job before my Social Security benefits started to roll in. I pressed enter and was immediately cheered by a confident reply promising that my request would be answered promptly.

But before my request was answered promptly, I received a curt voice mail message from Dorothy, my own personal "project adviser," informing me that by submitting a job proposal, I was duty-bound to abide by the site's honor system. Essentially, I was obligated to call any contractor who

Dorothy's response? The site would remind the contractor of his obligations. (Ooh, a reminder. That'll make him change his evil ways.) And, by the way, if I ended up hiring a contractor on my own who proved to be reliable, she'd appreciate it if I could let her know so that the site could sign him up.

Now the burden of finding reliable contractors had been shifted to me. Now I was being asked to work for a website I found totally unhelpful and even annoying.

Unluckily for Dorothy, locating good help in the home improvement area is not my forte. (Nor apparently is it the forte of the company she works for.) So, hopeless optimist that I am, I opted to try another home improvement website advertised in my local paper.

I went through a similar process. I spent 15 minutes filling out information including my name, address, project description and hoped-for budget. I was again encouraged by a cheery message telling me I could expect a response within a few days.

One week went by. Then three. Then I got a voice mail message. Unfortunately, the service didn't have any tile guys working in my area—although that didn't stop it from advertising to that effect in my local paper. In the future, the site did plan to expand its coverage to my neck of the woods. At that time, perhaps I'd be willing to give them another try?

The Party of the Third Part

Let's see. I can spend 15 minutes filling out a few screens worth of information, or I can flip through the phone book, pick out a contractor at random and spend 20 seconds leaving a voice mail message. The end result of either effort is that I still don't have anyone to tile my backsplash. And that's the problem inherent with service marketplaces: The people they try to hook you up with don't work for them. Therefore, there's no redress if the people they hook you up with turn out to be unreliable. It's not as if the website can fire them. And why would a good service provider need to use a third-party website to get referrals anyway? If it's good, word of mouth is the only advertising it needs.

What's a homeowner sitting in a shell of a house to do? The sanest strategy may be to sit tight and wait until the demand for projects falls in line with the supply of home improvement contractors. Then we can turn to the Yellow Pages and let our fingers do the walking for contractors. Reliable ones, only, of course. **CIO**

If you or anyone you know can lay a little tile, let Senior Editor Megan Santosus know at santosus@cio.com.



PHOTO BY LESLIE FEAGLEY

That's the problem inherent in service marketplaces: The people they try to hook you up with don't work for them. Therefore, there's no redress.

responded to my request; if I ended up hiring a contractor referred to me through the site or one I found on my own, I had to let Dorothy know.

Dorothy's snippy tone made me feel as if I'd already done something wrong, like that time in high school I decided to spend the night in Manhattan and didn't call my parents because I just didn't feel like it. Barely 24 hours old, my relationship with this website was already making me feel like a sulky adolescent. I didn't like Dorothy, and I didn't like having to deal with her. After all, isn't the Web supposed to shield you from having to deal with unpleasant tradesfolk and their ilk?

The next day, I got a curt e-mail informing me that the cost estimate I provided was woefully low. I got the impression that Dorothy felt I should've known better, even though getting an accurate estimate was one of the reasons I was using the site in the first place.

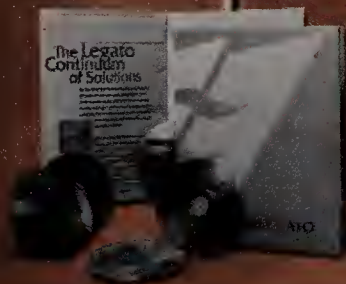
During the course of two weeks, a grand total of one contractor called to express interest in tiling my kitchen. We scheduled an appointment. He canceled at the last minute. I called him back to reschedule. I never heard from him again.

I wouldn't have minded the brush-off so much except that Dorothy kept peppering me with e-mails, reminding me of my moral obligation to keep her informed on the status of my project and urging me to deal with contractors referred to me through the site in a forthright and equitable manner. I e-mailed back that I was disappointed with the service. The number-one criteria on my initial request was reliability, I explained, and the one and only guy who responded—supposedly prescreened—demonstrated an utter lack of it.



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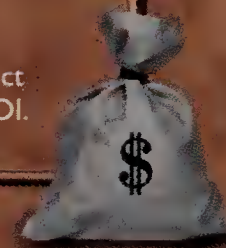
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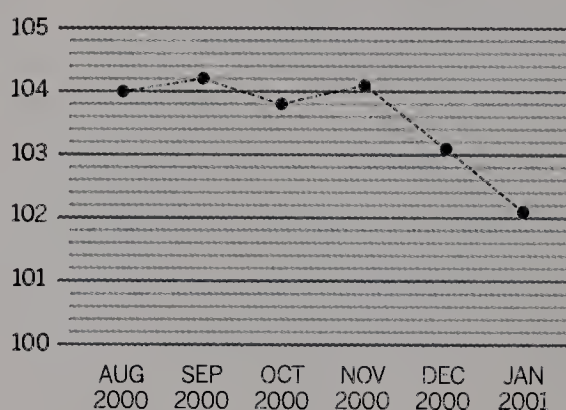
Gary J. Beach

"I THINK THERE is a world market for maybe five computers." So said Thomas Watson Sr. forecasting future sales for International Business Machines large-scale computers in 1943.

OK, the guy was off by a few hundred million. But the world of technology remains fascinated by the future. What's hot? What's not? Wall Street gurus make millions trying to predict it. What if *you* were able to peer into the future of technology spending for the next 12 months and know what the buying trends are for the total market and your specific industry? Would that interest you?

The Way IT Was Technology Growth IndexSM Aug. 2000–Jan. 2001

Since August 2000, the index—based on U.S. technology spending—has dropped from 104 to 102.1.



CIO magazine and Deutsche Bank Securities think so. Since June 2000, we have been quietly building an influential body named the CIO Leading Indicator Group. The goal of the group is simple: Predict technology buying trends for the next 12 months. This is a topic the press writes about as the driving

force in the "new" new economy. With nine pretests completed based on more than 1,000 responses, we are confident our index—the Technology Growth Index (TGI)—is an accurate predictor of future technology spending trends.

I can hear all the readers of this column asking, "Sounds interesting, but what do I have to do and what do I get out of it?" Fair questions. Membership in the CIO Leading Indicator Group is limited to either CIOs or the senior-most IT executives at their companies. And there's only one membership responsibility: monthly completion of a nonobtrusive survey that takes at most five minutes to complete. The survey will always be e-mailed midmonth, and the results will be released on the first of every month. All data is gathered and reported in total. No specific companies will be mentioned.

Membership privileges will include the opportunity to get detailed, drill-down data by total and specific industry. This will be of enormous value in helping you negotiate budget processes with your other "O" colleagues and get an even better deal from a vendor if the data shows the demand curve is slackening. In addition, membership will include a monthly conference call explaining survey data hosted by Edward Yardeni, chief investment strategist of Deutsche Bank Securities, and myself or Abbie Lundberg, editor in chief of *CIO*. Lastly, *CIO* and Deutsche Bank Securities also plan to host a private full-day analyst briefing session once a year in New York City, open solely to the members of the prestigious CIO Leading Indicator Group. Plans are also being completed to extend membership in the group to senior technology executives around the world.

Let's look into the future together. To join, e-mail me (gbeach@cio.com) or Bridget Cammarata (bridgetc@cxo.com), CXO Media's research director.

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Adviser Spotlight

"I often think about what life would be like had I lived 100 years ago," says Bud Mathaisel, CIO and corporate vice president at Solectron Corp., a Milpitas, Calif.-based electronics manufacturing company. "One thing I'm very grateful for is that we're living in a world with opportunity to change things. There's excitement in the

ability to do something for the world. A hundred years ago, I probably would have been a farmer."

Mathaisel has pursued many opportunities to affect change. In between working for the Walt Disney Co. and Ford Motor Co., he founded and directed Cap Gemini Ernst & Young's Center for Business Innovation (CBI), which also brought about a change in him. "When I founded the CBI and worked with academics, they

changed my point of view," he says. He learned that CIOs need to share more. One of the most useful things they can do is hobnob with fellow tech executives in all fields. "Why not share?" he says, dismissing worries about giving away any advantage by talking shop. "Anybody can buy the same golf clubs as Tiger Woods but not perform to his level."

Mathaisel thrives on those types of conversations with his peers, but he doesn't get as much time for it as he'd like. Solectron is growing at the rate of 50 percent a year, with 500 of its 65,000 employees working in IT. Mathaisel's corporate group of 135 IT staffers coordinates policy, directions and standards, and ensures smooth interaction between the company's 57 locations.

-Sandy Kendall



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Interview

BY STEWART DECK

Allan DITCHFIELD

Thirty years after a tour of duty in the U.S. Navy, Allan Ditchfield still stands yardstick straight and speaks with authority. Now an independent systems consultant and director of two Internet startups, he served as acting CEO at Allenbrook, an insurance software company in Lowell, Mass., after seven years as CIO at Cleveland-based Progressive Insurance. Before that he was senior vice president of systems engineering at MCI. Ditchfield recently wrote a speech he calls "What I Wish I Knew Earlier in My CIO Career" and shared some of his thoughts with CIO.

CIO: What are some lessons experience has taught you that you can now pass along?

Ditchfield: First, project management is vital. I didn't learn this early on, but it is perhaps the most important. In the past, I didn't plan things well and left out major work elements. I once built a billing system with microfiche output but forgot to include the microfiche readers. If you've done a reasonably comprehensive plan from your side and from the user side, something like that will stick out.

Be aware that managing change is crucial

to good project management. Manage expectations so that people understand something may cost more or that you need to shorten functional lists. Do this for the project group and sometimes for the whole corporation so that people don't say, "They always make promises, but they never deliver."

What else have you learned?

People are important, especially the smart ones. Work hard to find employees with the right background, attitude, hunger and energy. Then challenge them while making sure you provide time for R&R too. Give tangible evidence that indicates you believe people are an important resource.

When building teams, start small. With the right energy a small team can either solve a problem or get more resources, while too-large teams flounder. Next, some "important" subjects waste disproportionate time. Long discussions about overarching goals

or vision statements won't necessarily give you a lot back. I've also learned to be careful with high-tech fads. The press and all of us technologists love fads (like the latest PDA), but they can have real productivity and cost problems.

So, what advice do you give CIOs?

Plan and manage expectations. Initiate and accept business challenges. Think before pioneering with new technology, because pioneering can be expensive. Borrow ideas from anywhere, including competitors. Finally, keep your integrity; be open and fully disclose everything in advance—lunches with vendors, honoraria, trips, everything. Being forthright is always the best way to operate. **CIO**

Staff Writer Stewart Deck wants to hear what you've learned from your career experiences. E-mail him at sdeck@cio.com.





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